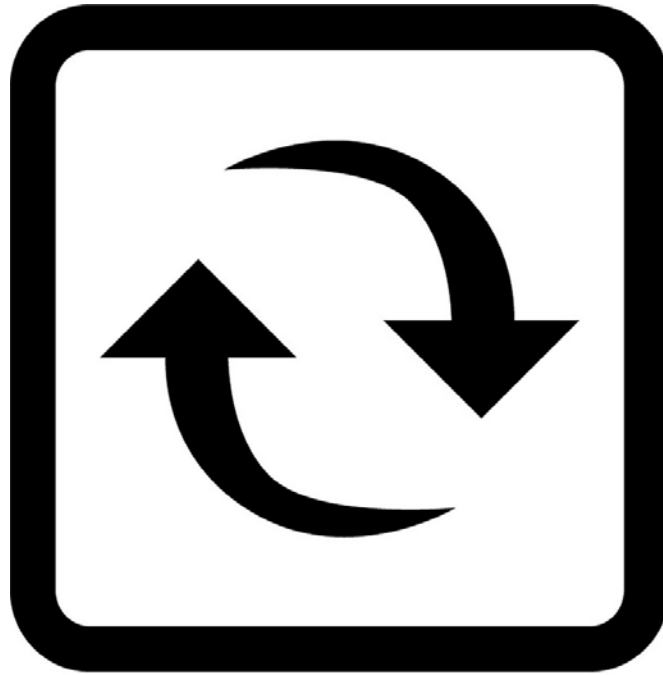




SERVERSCHECK

www.serverscheck.com

Sensors User Manual

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This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

For safety reasons, the SensorGateways and sensor probes may never be moved, fully or partially covered while operating.

Warranty:

For the warranty on this product please visit <https://serverscheck.com/>

OPENING SENSORGATEWAY OR EXTERNAL SENSOR PROBE VOIDS THE WARRANTY

Certifications:

The ServersCheck sensors are FCC (Class A) & CE (Class B) certified. Certificates can be downloaded from <https://serverscheck.com/sensors>

ServersCheck sensors were tested and certified by following international certification bodies:



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For technical support kindly visit <https://serverscheck.com/support>

1. ServersCheck Sensors Overview

1.1. Unboxing video of the ServersCheck sensors

We invite you to watch following unboxing video before unpacking, installing and configuring your ServersCheck sensors:

https://serverscheck.com/sensors/sensorgateway_unboxing_video.asp



1.2. SensorGateway Quick Overview

The SensorGateway is the heart of the ServersCheck environmental sensors. This base unit is where all the smart logic resides: from connection to monitoring, reporting and alerting.



The SensorGateway is connected to the network via a standard network cable over a 10/100Mbps network. It supports PoE too. This allows for powering the sensors without having to rely on external power adapters. If you don't have a PoE network then a power adapter is optionally available.

In the following sections of this user manual, we are going to describe in detail the configuration and operation of the base unit.

It is recommended to verify the calibration of the temperature probe in your environment and if an offset is noticed, to recalibrate the sensor as explained in section 11 of this document.

The maximum tested length between a PoE switch and the SensorGateway is 100ft or 30 meters.

Actuals may vary depending on cable quality, switch and environmental factors.

1.3. External Sensor Probes



ServersCheck uses external sensor probes for its environmental monitoring solution.

Only the power sensor requires a power adapter plugged into it; the power adapter's current sent to the sensor will be used to analyze the power state.



IMPORTANT NOTICE FOR WATER / FLOODING SENSORS

The flooding / water detection sensor consists of 2 parts: the sensor (gray box with ServersCheck label on it) and the yellow water sensing cable (shown left). Only the purple cable may be submerged – this is the water sensitive part of the sensors! The sensor probe (gray box) has to be kept at all times above the water level.

You can replace the shipped RJ45 cable with a custom standard RJ45 for a length of up to 10 meters or 33 ft between the SensorGateway and an external probe.

2. Connecting the ServersCheck Sensor Probes

2.1. General Instructions

The sensor should be connected as shown in the picture below. The RJ45 to RJ45 cable goes from the external sensor probe into the bottom of the SensorGateway using the RJ45 connector labeled **Serial** (for SensorGateway v1, v2 & v3) SensorGateway v4 or higher have 2 connectors for external probes labeled **Probe1** and **Probe2**



On the top you plug in your network cable connected to a switch and this into the RJ45 connector labeled **LAN/PoE**. If you don't have a PoE enabled network, then you will need the optional 12DC power adapter and plug it into the connector on top labeled **DC 12V**



Important note: It is highly recommended to reboot the SensorGateway after adding or removing any sensor probes for stability. Also, using incorrect power supplies or wrong PoE source may permanently damage the equipment and void the warranty.

2.2. View of connected Temperature Sensor



2.3. View of connected Temperature & Humidity Sensor



- Considerations for humidity sensor:
 - o Very dependent on air flow
 - o For rooms with different levels of air flows which is usually those in front of AC units and those that aren't, you can calibrate accordingly for more accurate results of ambient level and rack or other specific point levels of humidity

2.4. View of connected Flooding Sensor



2.5. View of connected a Power Failure Sensor



2.6. View of the Airflow Sensor



The displayed side will be the one where the air should be allowed to flow. As an example, on an environment where floor cooling is utilized, the implementation would be similar to the ff. figure:



Since we're utilizing floor cooling on this example, the side where the air should flow is placed facing downwards to detect the airflow it should have.

3. Using the Wireless Sensors



3.1. Connect wireless hub to SensorGateway

Firstly, as shown in the picture, connect the SensorGateway to the wireless hub directly with an RJ45 connector as that will be the medium between the wireless sensors and the SensorGateway.

3.2. Connect wireless sensors to SensorGateway

In preparation for this section, make sure to have with you a pin or some similar object that will fit through the tiny hole on the left side of the wireless sensor.

Step 1: Wireless Information Section

Navigate on that page from your SensorGateway's web server and click *Enable* on the "Permit New Wireless Devices" section as seen below.

Permit New Wireless Devices

New wireless sensor must join within 60 seconds.

Step 3: Joining the wireless sensor

Take note how this has a limit of 60 seconds upon clicking as shown above. After doing that, on the small hole on the left side of the wireless sensor, make a series of quick clicks for 4 times with an interval of <1 second per click. You will then see the LED indicator blink 1-3 times on the device.

From the Wireless Information page, you should now see a signal being received on the Rssi column as well as its type. Serial, Name, and Batt Level will be populated approximately 5 minutes. You'll be seeing the following once those have happened.

Wireless Info

No.	Serial	Name	Type	Rssi	Batt Level
1	WT--0013	wtemp1	Temperature	-54 dBm	100 %
2		wtemp2	N/A	-1 dBm	-1 %
3		whum1	N/A	-1 dBm	-1 %
4	WT--0016	wtemp3	Temperature	-43 dBm	100 %
5	WT--0012	wtemp4	Temperature	-44 dBm	100 %
6	WTH-0005	wtemp5	Temperature	-44 dBm	100 %
7	WTH-0005	whum2	Humidity	-58 dBm	100 %
8		Ext. Temp	N/A	-1 dBm	-1 %
9		Ext. Temp	N/A	-1 dBm	-1 %
10		Ext. Temp	N/A	-1 dBm	-1 %
11		Ext. Temp	N/A	-1 dBm	-1 %
12		Ext. Temp	N/A	-1 dBm	-1 %
13		Ext. Temp	N/A	-1 dBm	-1 %
14		Ext. Temp	N/A	-1 dBm	-1 %
15		Ext. Temp	N/A	-1 dBm	-1 %
16		Ext. Temp	N/A	-1 dBm	-1 %

Finally, after which, you will now be able to view your wireless sensors. From here on, the wireless sensor will update the wireless hub every 2 minutes.

Sensor Status

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS	SNMP Trap
	Internal Temp	Temp	Int. Temp	24.20 °C	< 18.1 or > 37.1	< 15.1 or > 41.1	☐	☐	☐	☐
	Temperature	Temp	Ext. Temp	22.25 °C	< 18.1 or > 25.1	< 15.1 or > 29.1	☐	☐	☐	☐
	Wireless Sensor	Temp	wtemp1	21.50 °C	< 18.1 or > 25.1	< 15.1 or > 29.1	☐	☐	☐	☐
	Wireless Sensor	Temp	wtemp2	23.16 °C	< 18.1 or > 25.1	< 15.1 or > 29.1	☐	☐	☐	☐
	Wireless Sensor	Humidity	whum1	56.50 %RH	< 45.1 or > 65.1	< 40.1 or > 70.1	☐	☐	☐	☐
	Wireless Sensor	Temp	wtemp4	22.43 °C	< 18.1 or > 25.1	< 15.1 or > 29.1	☐	☐	☐	☐
	Wireless Sensor	Temp	wtemp5	22.33 °C	< 18.1 or > 25.1	< 15.1 or > 29.1	☐	☐	☐	☐
	Wireless Sensor	Humidity	whum2	57.14 %RH	< 45.1 or > 65.1	< 40.1 or > 70.1	☐	☐	☐	☐
Update Reset										

3.3. Disconnecting the wireless sensors

For security purposes, if one opts to disjoin the wireless sensors from the SensorGateway, you can do so by holding the function button for 10 seconds. Once that's done, you'll see the LED indicator blink 1-3 times and upon navigating to the wireless info section, the triggered wireless sensor should now be unregistered, losing its information starting on the Rssi and Batt Level columns. Upon doing a reload on the browser, the disconnected wireless sensor will look similar to what's highlighted:

Wireless Info

No.	Serial	Name	Type	Rssi	Batt Level
1	WT--0013	wtemp1	Temperature	-60 dBm	100 %
2	WTH-0004	wtemp2	Temperature	-40 dBm	100 %
3	WTH-0004	whum1	Humidity	-48 dBm	100 %
4	WT--0016	wtemp3	Temperature	-41 dBm	100 %
5		wtemp4	N/A	-1 dBm	-1 %
6	WTH-0005	wtemp5	Temperature	-34 dBm	100 %
7	WTH-0005	whum2	Humidity	-58 dBm	100 %

At this point, you have now successfully disconnected your wireless sensor from the SensorGateway.

3.4. Restrictions

Only one (1) wireless hub can be connected to the SensorGateway. While the wireless hub is able to retrieve values from 30 sensors, please be reminded that this doesn't mean 30 physical sensors can be read by it. This dilemma arises when using a temperature and humidity sensor since one physical sensor will count for two logical sensors. Thus when opting for that type of sensor, for example, you'll be restricted to permit 15 temperature and humidity sensors to your wireless hub. But otherwise for the temperature (only) sensor, you can go for up to 30 physical temperature sensors.

3.5. Reconnection Window

For a number of reasons, if a wireless sensor fails to send its update, it will try to connect every minute for 3 times. After that, if it still fails, it will try to reconnect every 5 minutes for 1 hour (12 times). If during that period the sensor still fails to push its data, it will now go to sleep in order to save its battery. From that point onwards, you'll have to manually rejoin the wireless sensor once more as indicated on the Wireless Information section.

4. Configuring the SensorGateway to the Network

The SensorGateway can have 2 types of IPv4 addresses: Fixed or Dynamic (using DHCP).

The default IP address from factory of the SensorGateway is **192.168.11.160**

To change the IP address to a different fixed one or to DHCP, proceed as follows.

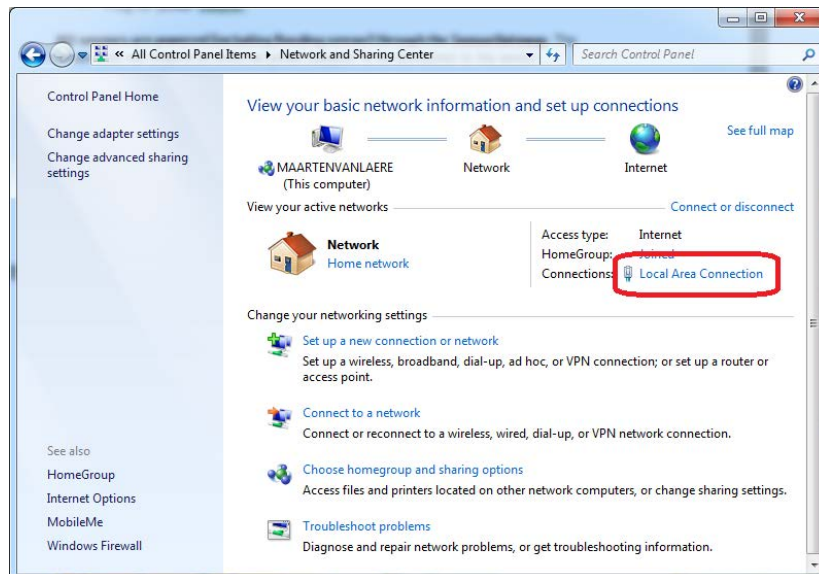
We highly recommend not to use DHCP but instead to use fixed IP addresses.

Make sure the SensorGateway is plugged with a network cable into the network.

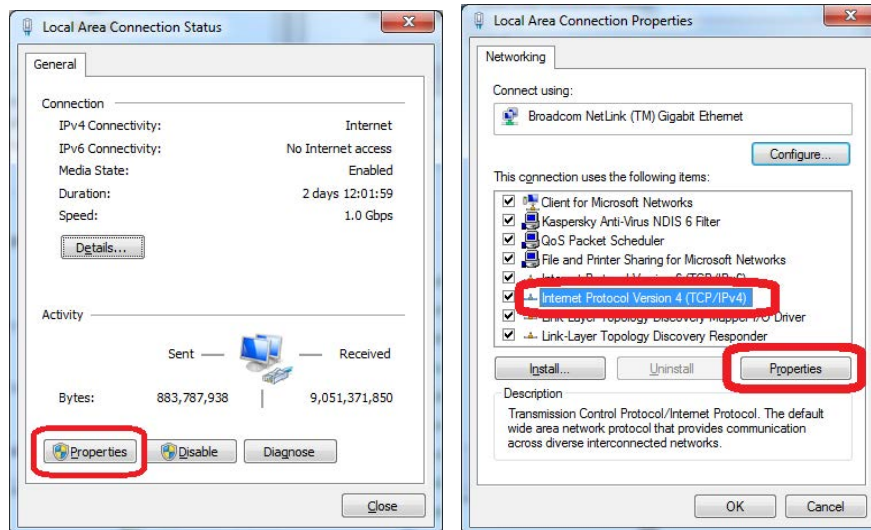
4.1. Set your PC in the same network segment as the SensorGateway

The steps below apply to a Windows 7 system. For other systems (Windows, Mac, *Nix) steps are similar.

Go to **Network Panel > Network & Sharing Center**

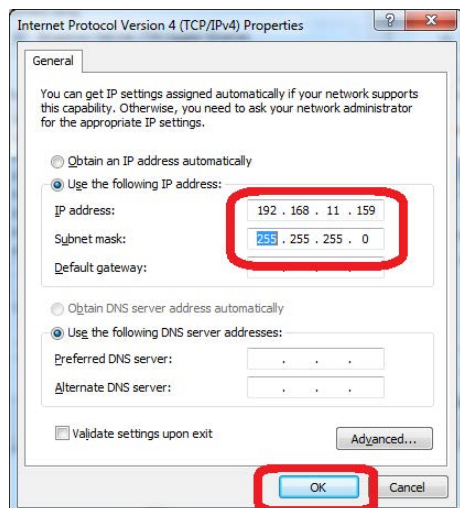


Click on **Local Area Connection** and then click on **Properties**. In the new window select **Internet Protocol Version 4** and click on the **Properties** button.



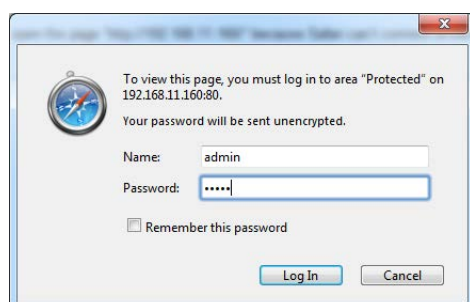
Now you need to set in the Properties window your PC in the same IP range as the sensor. Remember the current settings of your PC before changing any value!

We recommend setting it to 192.168.11.159 as shown below. When done, click on the **OK** button.



4.2. Connecting to the SensorGateway

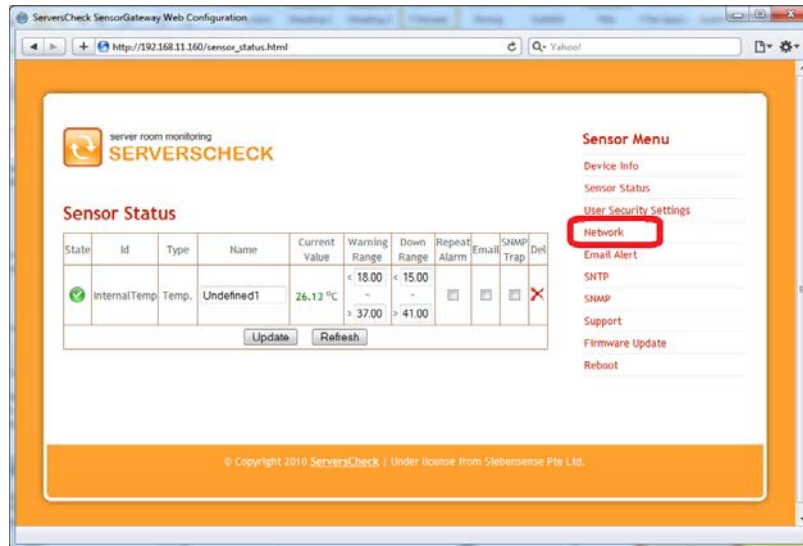
Open your browser and surf to <http://192.168.11.160> A connection will be made to the web server on board of the SensorGateway and you will be prompted for a username & password. Default username and password is: **admin / admin**



When logged in you will be shown the main screen of the SensorGateway with the first sensor reading being the built-in temperature probe.

Any temperature probe (built-in or external) has been calibrated for accuracy in specific conditions that may defer from your actual setup. Unlike other sensors, the ServersCheck sensors can be easily adjusted to correct the potential offset of the temperature probe. See section

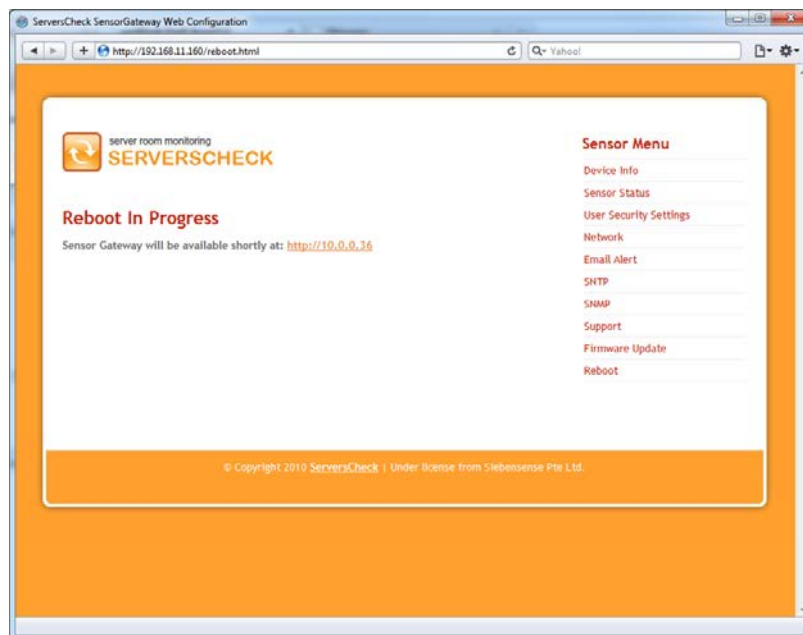
In the main window, click on the **Network** option in the right hand side menu



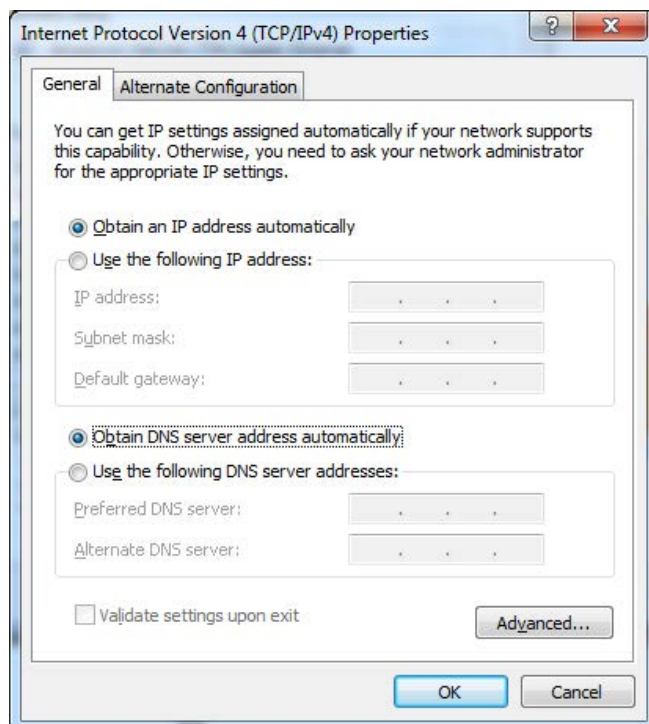
You can now change the SensorGateway's IP address to any value you like: either to DHCP or to a fixed IP. We will now set it to 10.0.0.36



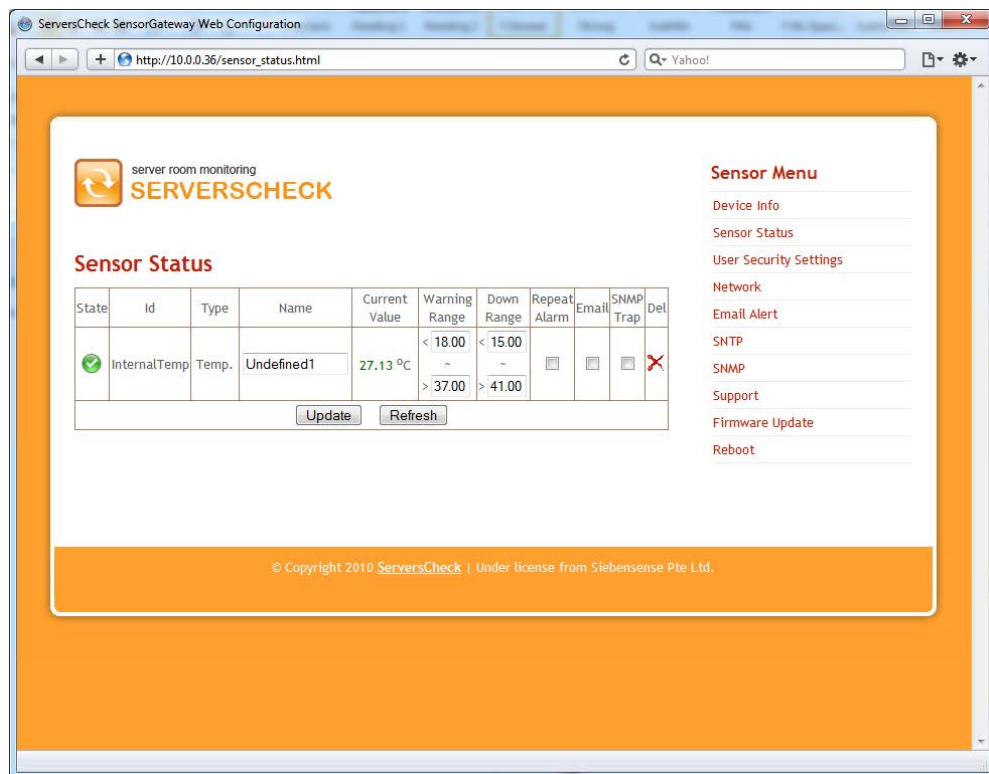
Once the value has been changed, the SensorGateway will reboot itself and will then be accessible through the newly defined IP.



Now reset your system to its normal IP address. In our case we reset it to DHCP.

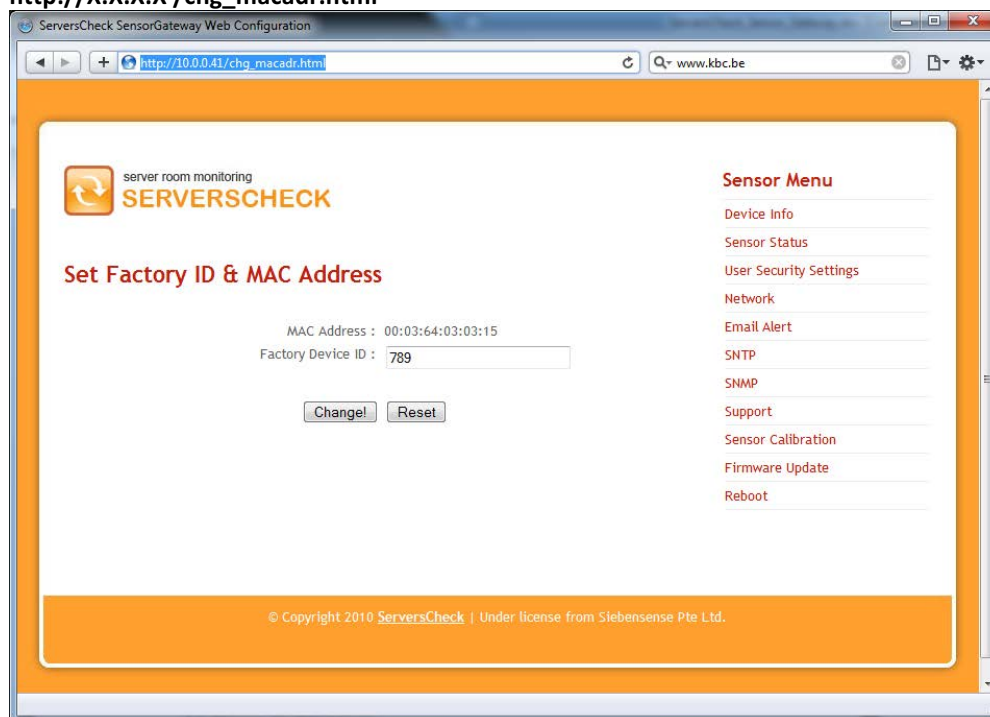


We will now check the SensorGateway and connect to its new IP address by connecting to it using a browser.



4.3. Changing the MAC Address

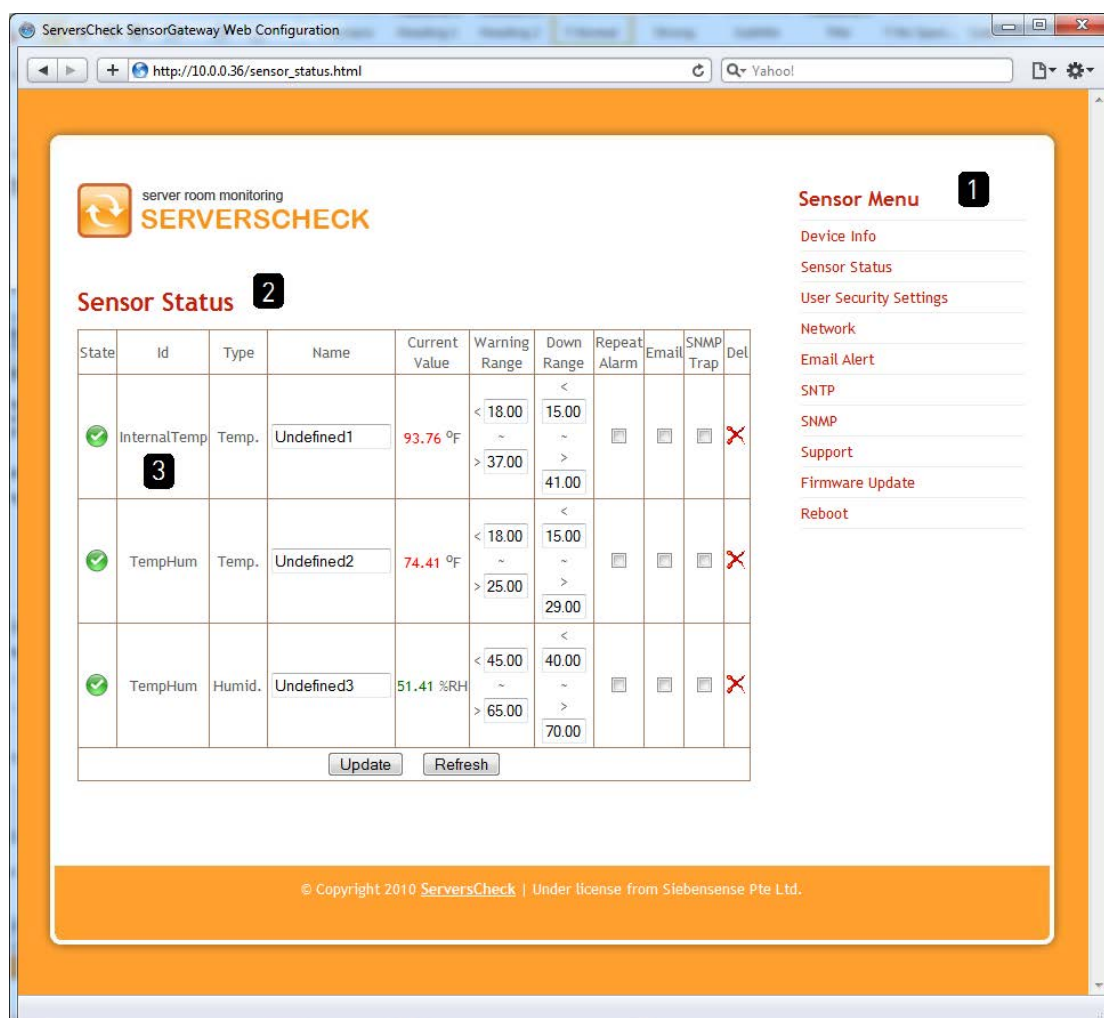
The MAC address of a SensorGateway can be changed by going to the special web page at http://X.X.X.X/chg_macadr.html



Enter a new 4 digit number for factory device ID and the MAC address will be changed.

5. SensorGateway Interface Overview

Connect to the ServersCheck SensorGateway using your browser and on the IP address defined in previous section.



(1) This is the main navigation menu of the ServersCheck SensorGateway. All the different menu options are outlined in the following sections of the user manual.

(2) Is the screen of the actual menu option you are in. Whenever connecting to the SensorGateway, it always shows the Sensor Status page first with the latest sensor readings refreshed every 5 seconds.

(3) The InternalTemp shown in here is the Internal Temperature Sensor of the SensorGateway. External probes are shown below the built-in temperature probe.

Depending on the conditions in which the SensorGateway and/or probes are placed, a smaller or larger offset compared to actuals from a certified calibration system may be noticed. To solve that, the sensors can be easily recalibrated as explained in section 11 of this document.

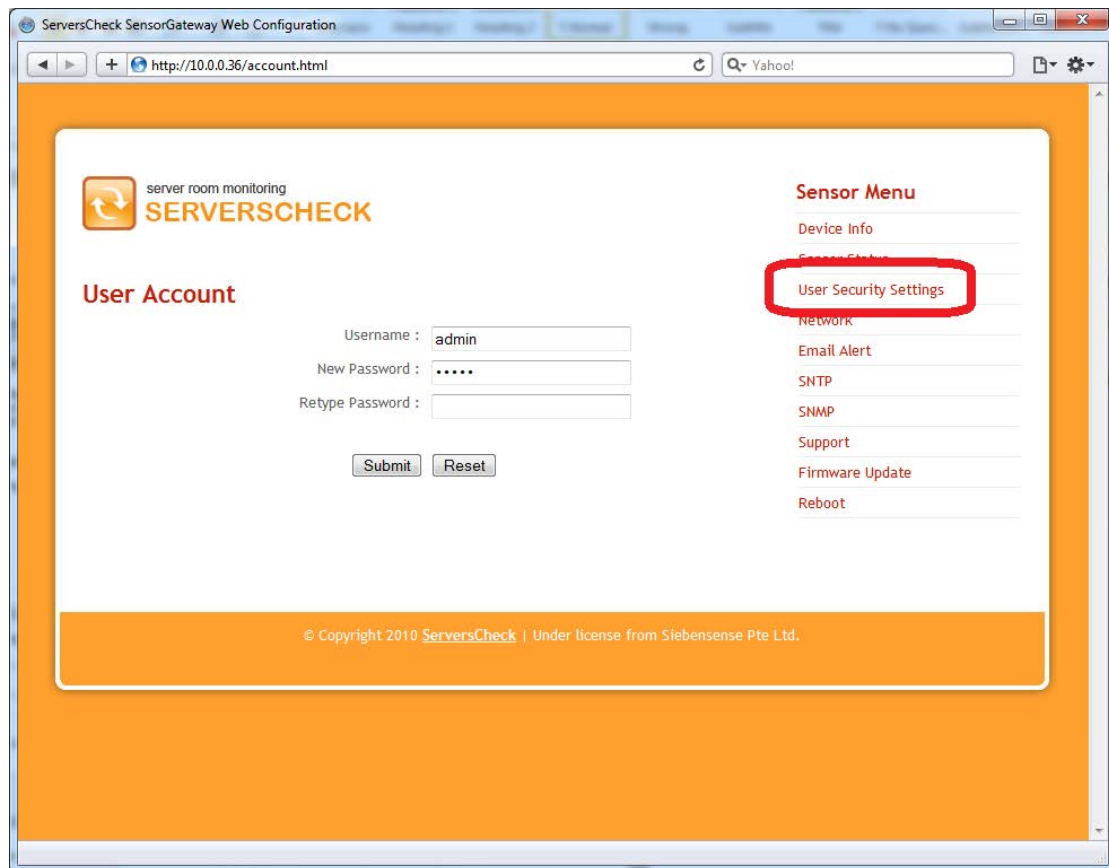
5.1. HTTPS Access

The SensorGateway can be accessed via HTTPS by choosing "Enable" on the "Https Access" field found on the "Device Info" page. Before the unit becomes exclusively available only through HTTPS, you'd have to restart the browser used first.

6. Configuring the SensorGateway's access security

The SensorGateway's can be username and password secured. Default factory values are **admin / admin**

To change the values click on the **User Security Settings** menu option

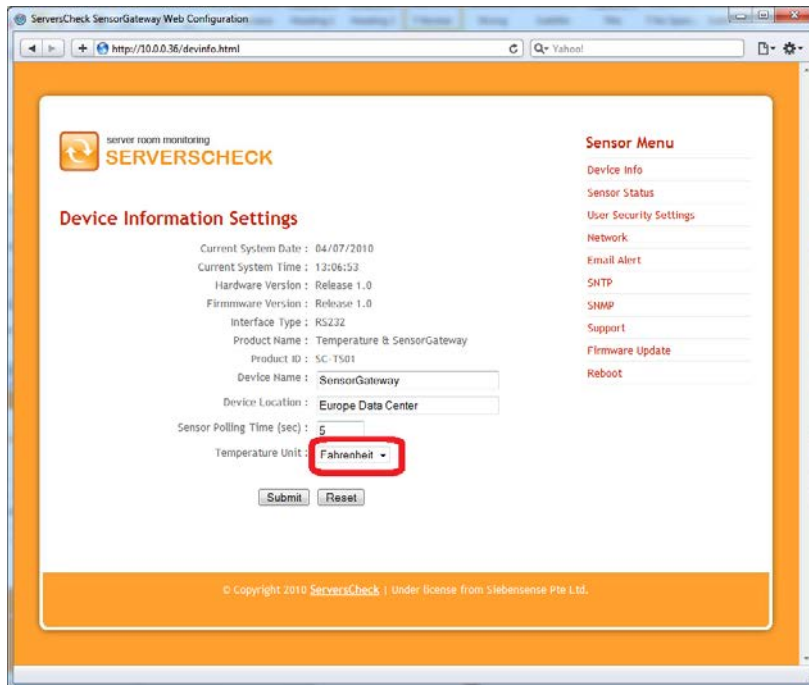


When done click on the **Submit** button. You will be prompted for the new username and password.



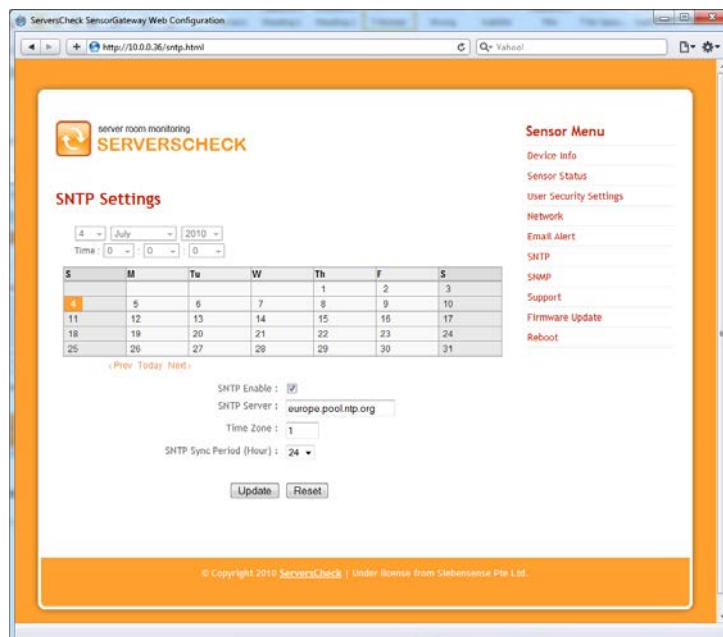
7. Configuring the Farenheit / Celsius readings

The default setup is readings in Celsius. However through a simple switch, the sensor readings can be set to Farenheit. Simply connect to the SensorGateway, click on the **Device Info** menu option and change the value to **Farenheit**



8. Configuring internal clock of the SensorGateway

To modify the internal clock, click on the **SNTP** menu option. You can either set it manually or have it synchronized with a time server as shown in the picture below. Click on **Submit** when done



SensorGateway hardware version 5 users may experience an issue with configuring the time server for a negative time zone. This has been fixed in firmware 3.0.2 which can be downloaded from our website.

Following table provides a list of time zones in UTC offset per country.

Country	UTC time offset	Country	UTC time offset
A		M	
Afghanistan	+04	Macedonia *	+01
Albania *	+01	Madagascar	+03
Algeria	+01	Malawi	+02
Andorra *	+01	Malaysia	+08
Angola	+01	Maldives	+05
Antigua and Barbuda	-04	Mali	±00
Argentina	-03	Malta *	+01
Armenia	+04	Marshall Islands	+12
Australia – 5 time zones		Mauritania	±00
		Mauritius	+04
		Mexico * – 3 time zones	
Western Australia +08 Northern Territory +09 South			
Australia * +09 Australian Capital Territory * +10 New South		The state of Baja California -08 The states of Baja California	
Wales * +10 Queensland +10 Tasmania * +10 Victoria * +10		Sur, Chihuahua, Nayarit, Sinaloa and Sonora -07 Most of	
Lord Howe Island * +10 Macquarie Island +11		Mexico -06	
Australian Overseas Territories – 6 time zones		Micronesia – 2 time zones	
Heard Island and McDonald Islands +05 Cocos (Keeling)		The states of Chuuk and Yap +10 The states of Kosrae and	
Islands +06 Christmas Island +07 Ashmore and Cartier		Pohnpei +11	
Islands +08 Coral Sea Islands +10 Norfolk Island +11		Moldova *	+02
Austria *	+01	Monaco *	+01
Azerbaijan *	+04	Mongolia * – 2 time zones	
B			
Bahamas *	-05		
Bahrain	+03	Provinces of Khovd, Uvs, Bayan-Olgii +07 Ulaanbaatar and	
Bangladesh	+06	most of the country +08	
Barbados	-04	Montenegro *	+01
Belarus	+03	Morocco *	±00
Belgium *	+01	Mozambique	+02
Belize	-06	Myanmar (Burma)	+06::
Benin	+01		

Bhutan	+06	N	
Bolivia	-04	Namibia	+01
Bosnia and Herzegovina *	+01	Nauru	+12
Botswana	+02	Nepal	+05:45
Brazil – 4 time zones		Netherlands *	+01
		Netherlands Overseas Territories – 1 time zones	
Acre and Southwestern Amazonas –05 Most part of the Amazonas State, Mato Grosso, Mato Grosso do Sul, Rondônia, Roraima –04 The Southeast, the South, the Northeast Regions (except some islands), Goiás, Distrito Federal, Tocantins, Pará, Amapá –03 Islands on the east coast of Brazil (Fernando de Noronha, Trindade, Martin Vaz, Atol das Rocas, Saint Peter and Paul Rocks) –02		Aruba –04 Caribbean Netherlands –04 Curaçao –04 Sint Maarten –04	
Brunei	+08	New Zealand *	+12
Bulgaria *	+02	New-Zealand's Dependent Territories – 4 time zones	
Burkina Faso	±00		
Burundi	+02	Niue –11 Cook Islands –10 Chatham Islands +12:45 Tokelau +13	
C		Nicaragua	-06
Cabo Verde	-01	Niger	+01
Cambodia	+07	Nigeria	+01
Cameroon	+01	North Korea	+09
Canada – 6 time zones		Norway *	+01
		O	
Larger western part of British Columbia, Tungsten and the associated Cantung Mine in Northwest Territories, Yukon –08 Alberta, some eastern parts of British Columbia, the Northwest Territories, Nunavut (west of 102°W and all communities in the Kitikmeot Region), Lloydminster –07 Manitoba, Nunavut (between 85°W and 102°W except western Southampton Island), Ontario (Northwestern Ontario west of 90°W with some exceptions and Big Trout Lake area east of 90°W), Saskatchewan except Lloydminster –06 Nunavut east of 85°W and entire Southampton Island, Ontario east of 90°W (except Big Trout Lake area), the most part of Quebec –05 Labrador (all but southeastern tip), New Brunswick, Nova Scotia, Prince Edward Island, eastern part of Quebec –04 Labrador (southeastern), Newfoundland –03		Oman	+04
Central African Republic	+01	P	
Chad	+01	Pakistan	+05
Chile	-04	Palau	+09
Chile - Easter Island	-06	Palestine *	-06
China	+08	Panama	-05
Colombia	-05	Papua New Guinea	+10
Comoros	+03	Paraguay	-04
Congo, Republic of the	+01	Peru	-05
Congo, Dem. Rep. - Kinshasa	+01	Philippines	+08
Congo, Dem. Rep. - Lubumbashi	+02	Poland *	+01
Costa Rica	-06	Portugal *	±00
Cote d'Ivoire	±00	Portugal - Azores *	+01
Croatia *	+01	Q	
Cuba *	-05	Qatar	+03
Cyprus *	+02	R	
Czech Republic *	+01	Romania *	+02
D		Russia – 9 time zones	
Denmark *	+01		
Denmark's Dependent Territories * – 4 time zones		Kaliningrad Oblast +03 Most of European Russia and all railroads throughout Russia +04 Bashkortostan, Chelyabinsk Oblast, Khanty-Mansiya, Kurgan Oblast, Orenburg Oblast, Perm Krai, Sverdlovsk Oblast, Tyumen Oblast, and Yamalia +06 Altai Krai, Altai Republic, Kemerovo Oblast, Novosibirsk Oblast, Omsk Oblast and Tomsk Oblast +07 Khakassia, Krasnoyarsk Krai and Tuva +08 Buryatia and Irkutsk Oblast +09 Amur Oblast, western Sakha Republic and Zabaykalsky Krai +10 The Jewish Autonomous Oblast, Khabarovsk Krai, Primorsky Krai, central Sakha Republic and Sakhalin Island +11 Magadan Oblast, eastern Sakha, Kuril Islands, Chukotka and Kamchatka Krai +12	
		Rwanda	+02
The most of Greenland, including inhabited south coast and west coast –03 Greenland - Thule Air Base –04 Greenland - Ittoqqortoormiit –01 Faroe Islands ±00		S	
Djibouti	+03	St. Kitts and Nevis	-04
Dominica	-04	St. Lucia	-04
Dominican Republic	-04	St. Vincent and The Grenadines	-04
E		Samoa	+13
Ecuador	-05	San Marino *	+01
Ecuador - Galapagos Province	-06	Sao Tome and Principe	±00
Egypt	+02	Saudi Arabia	+03
El Salvador	-06	Senegal	±00
Equatorial Guinea	+01	Serbia *	+01
Eritrea	+03	Seychelles	+04
Estonia *	+02	Sierra Leone	±00
Ethiopia	+03	Singapore	+08
F		Slovakia *	+01
		Slovenia *	+01
		Solomon Islands	+11
		Somalia	+03
		South Africa	+02
		South Korea	+09
		South Sudan	+03
		Spain *	+01

Fiji	+12	Spain - Canary Islands *	±00
Finland *	+02	Sri Lanka	+05
France *	+01	Sudan	+03
French Overseas Territories – 10 time zones		Suriname	–03
		Swaziland	+02
French Polynesia - Tahiti Island –10 French Polynesia -		Sweden *	+01
Marquesas Islands –09 French Polynesia - Gambier Islands		Switzerland *	+01
–09 Clipperton Island –07 Guadeloupe –04 Martinique –04		Syria *	+02
Saint Barthelemy –04 Saint Martin –04 French Guiana –03		T	
Saint Pierre and Miquelon * –03 Mayotte +03 Réunion +04		Taiwan	+08
Kerguelen Islands +05 New Caledonia +11 Wallis and Futuna		Tajikistan	+05
+12		Tanzania	+03
G		Thailand	+07
Gabon	+01	Timor-Leste	+09
Gambia	±00	Togo	±00
Georgia	+04	Tonga	+13
Germany *	+01	Trinidad and Tobago	–04
Ghana	±00	Tunisia	+01
Greece *	+02	Turkey *	+02
Grenada	–04	Turkmenistan	+05
Guatemala	–06	Tuvalu	+12
Guinea	±00	U	
Guinea-Bissau	±00	Uganda	+03
Guyana	–04	Ukraine	+02
H		United Arab Emirates	+04
Haiti *	–05	United Kingdom *	±00
Honduras	–06	British Overseas Territories – 9 time zones	
Hungary *	+01		
I			
Iceland	±00	Pitcairn Islands –08 Cayman Islands –05 Anguilla –04	
India	+05	Bermuda –04 British Virgin Islands –04 Montserrat –04	
Indonesia – 3 time zones		Turks and Caicos Islands –04 Falkland Islands –03 South	
		Georgia and the South Sandwich Islands –02 Saint Helena	
Islands of Sumatra, Java, provinces of West Kalimantan and		±00 Ascension and Tristan da Cunha ±00 Guernsey * ±00 Isle	
Central Kalimantan +07 Islands of Sulawesi, Bali, provinces		of Man * ±00 Jersey * ±00 Gibraltar * +01 Akrotiri and	
of East Nusa Tenggara, West Nusa Tenggara, East		Dhekelia * +02 British Indian Ocean Territory +06	
Kalimantan and South Kalimantan +08 Provinces of Maluku,		United States of America * – 6 time zones	
North Maluku, Papua and West Papua +09			
Iran *	+03		
Iraq	+03	Hawaii, most of the Aleutian Islands –10 Most of the state	
Ireland *	±00	of Alaska –09 The states on the Pacific coast plus Nevada,	
Israel *	+02	parts of Idaho –08 Arizona, Colorado, Montana, New	
Italy *	+01	Mexico, Utah, parts of Idaho, Kansas, Oregon, North Dakota,	
J		South Dakota, Texas –07 Gulf Coast, Tennessee Valley, U.S.	
Jamaica	–05	Interior Highlands, Great Plains, most of Texas –06 The	
Japan	+09	states on the Atlantic coast, the eastern two-thirds of the	
Jordan *	+02	Ohio Valley, most of Michigan –05	
K		US Dependent Territories – 7 time zones	
Kazakhstan - Oral, Aktobe	+05		
Kazakhstan - Almaty, Astana	+06	Baker Island –12 Howland Island –12 American Samoa –11	
Kenya	+03	Kingman Reef –11 Midway Islands –11 Palmyra Atoll –11	
Kiribati – 3 time zones		Jarvis Island –10 Johnston Atoll –10 Navassa Island –05	
		Puerto Rico –04 US Virgin Islands –04 Guam +10 Northern	
Gilbert Islands +12 Phoenix Islands +13 Line Islands +14		Mariana Islands +10 Wake Island +12	
Kosovo *	+01	Uruguay	–03
Kuwait	+03	Uzbekistan	+05
Kyrgyzstan	+06	V	
L		Vanuatu	+11
Laos	+07	Vatican City (Holy See) *	+01
Latvia *	+02	Venezuela	–04
Lebanon *	+02	Vietnam	+07
Lesotho	+02	Y	
Liberia	±00	Yemen	+03
Libya	+01	Z	
Liechtenstein *	+01	Zambia	+02
Lithuania *	+02	Zimbabwe	+02
Luxembourg *	+01		

9. Configuring the SensorGateway for SNMP

In this section we are going to explain how the ServersCheck sensors can interact with SNMP enabled management systems.

The SensorGateway supports 2 kinds of SNMP messages:

- Pulling: a network management systems requests status for the sensors through SNMP get requests
- Pushing: the SensorGateway pushing SNMP notifications (called SNMP Traps) to network or building management systems

To illustrate SNMP, we will use the free (for personal use) SNMP Browser from iReasoning which is available from the following URL:

<http://ireasoning.com/mibbrowser.shtml>

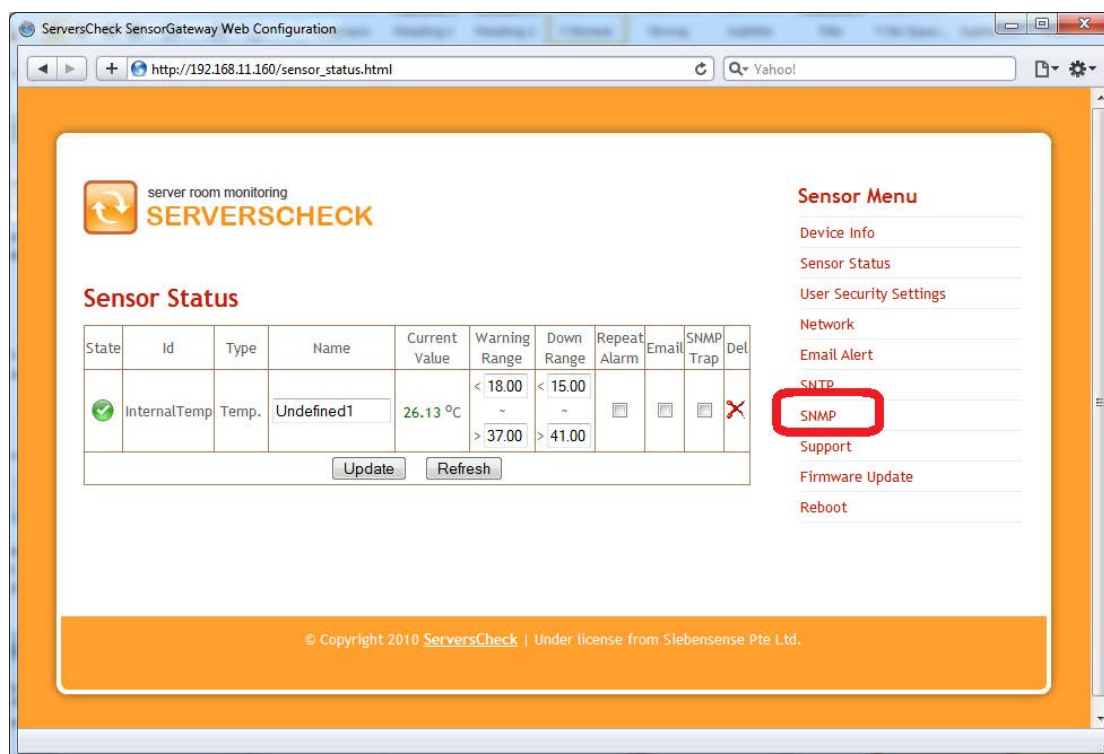
9.1. SNMP Get Requests

In the SensorGateway the built-in SNMP agent needs to be enabled to allow for querying of the sensor by external applications using the SNMP GET protocol.

The SensorGateway has its own MIB file which can be downloaded here:

<http://downloads.serverscheck.com/sensors/sensorgateway.mib>

To enable SNMP, connect to the SensorGateway and click on the **SNMP** menu option



You need now to enable the **SNMP Agent** (default port for this UDP 161). If you want to use a different community string, then you can change the value too. Community string is limited to 8 characters. Default value for a read community is typically **public**

Make sure the community string does not exceed 8 characters

ServersCheck SensorGateway Web Configuration - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Go to a Website

74 Thu Feb 14 20:29:36 2013 - Sensor - Shock - TEMPERATURE: Error level: 66.76 (returned value) greater than 40

SERVERSCHECK

server room monitoring
SERVERSCHECK

SNMP Settings

SNMP Agent
Agent Enable ☒
Port: 161 Version: SNMPv2
SNMP V2 Community
Read Community: public
Write Community: public

SNMP V3 USM
Username:
Auth Key: Protocol: MD5
Privacy Key: Protocol: AES

SNMP Trap
Trap Enable: ☐
Trap Version: SNMPv1
Trap IP: 0.0.0.0 Port: 0
V2 Community:

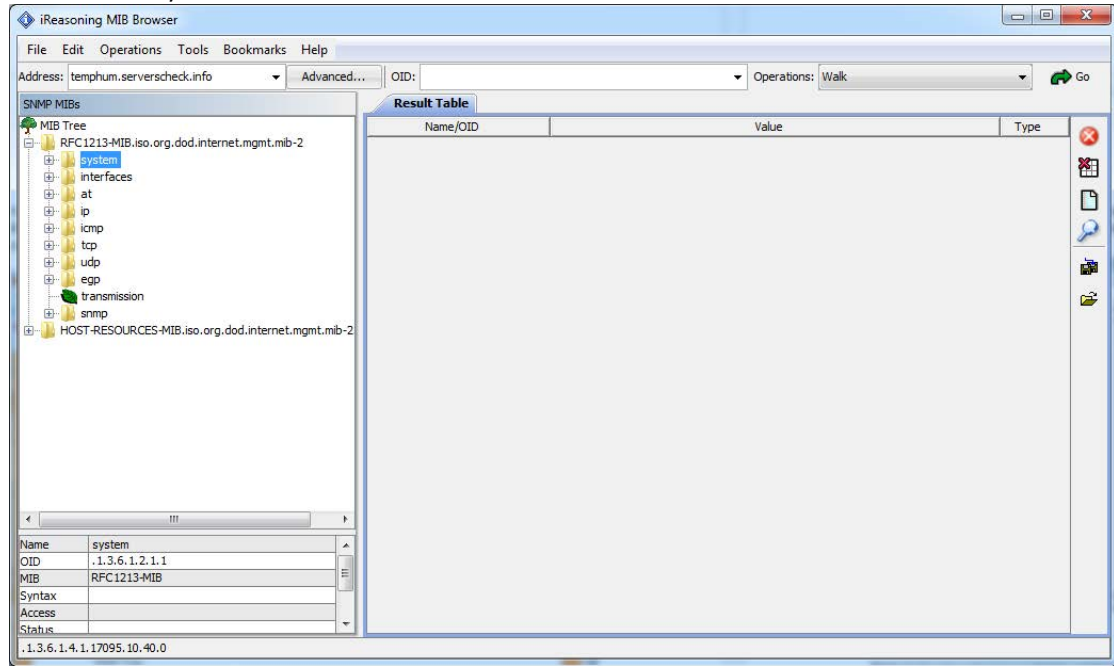
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Sensor Menu

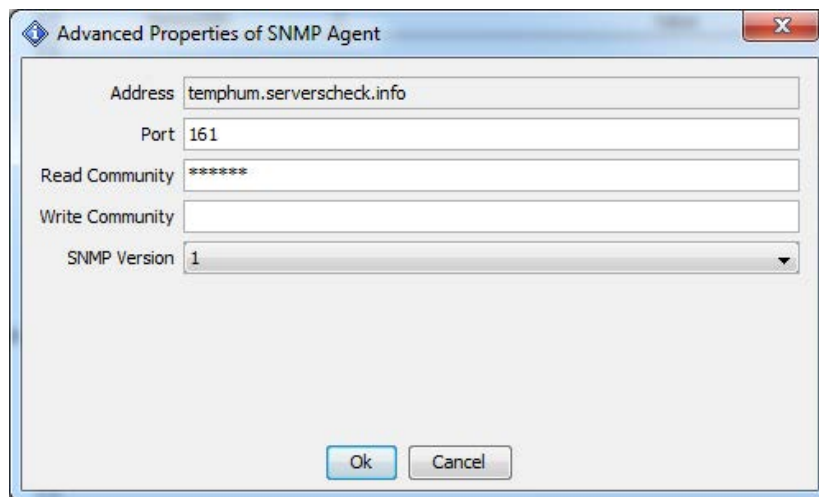
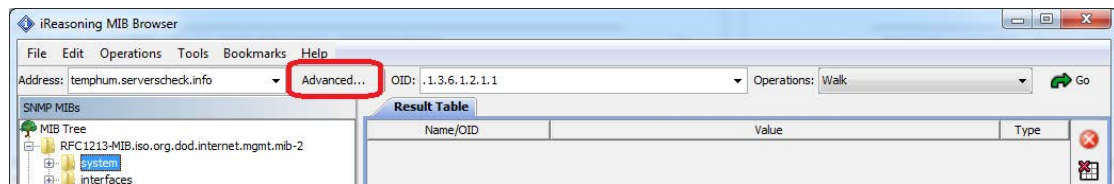
- Device Info
- Sensor Status
- User Security Settings
- Network
- Email Alert
- SMS Alert
- SNTP
- SNMP
- Support
- Sensor Calibration
- Firmware Update
- Reboot

Click on the **Submit** button when done.

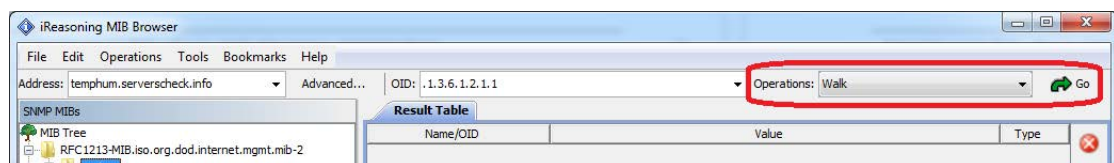
Now let's open the iReasoning MIB Browser. Set the **Address** field to the IP address of your SensorGateway



Click on the **Advanced** button

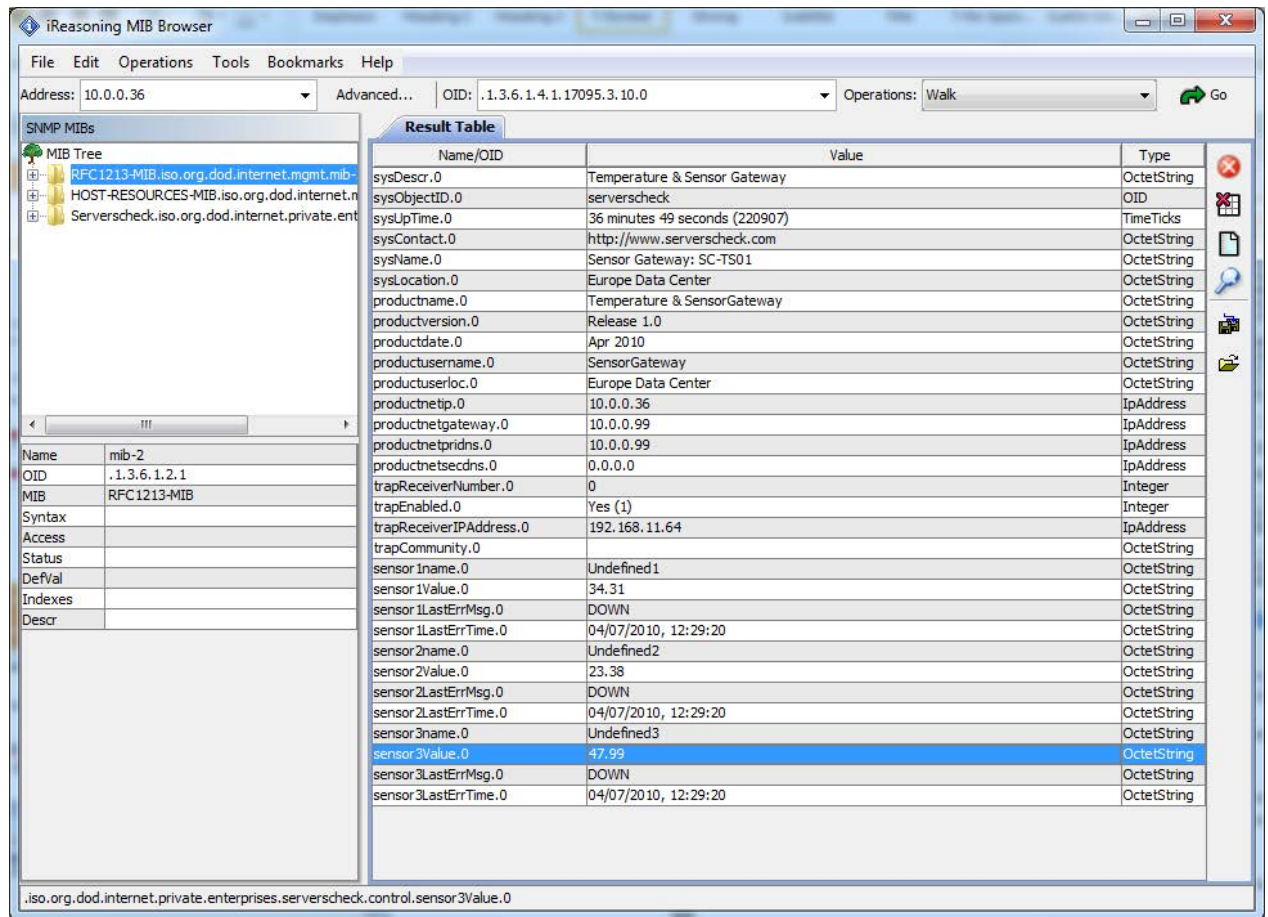


In above screen confirm the Port as previously defined as well as the read community. Click on the **OK** button.



In the main screen, set the **Operations** drop down box to **Walk**

When done, click on the **Go** button



In the above screen copy you see all the SNMP parameters as made available by the ServersCheck SensorGateway.

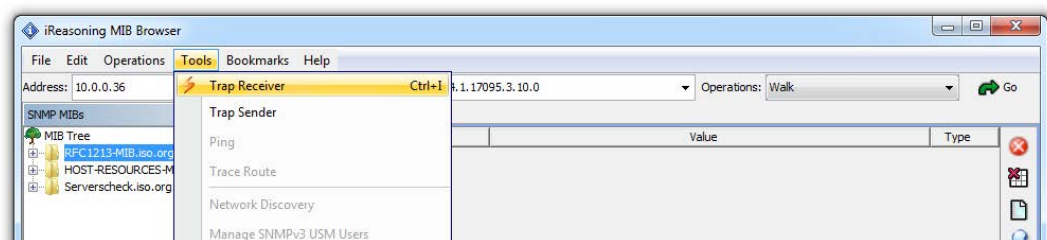
At the bottom you will see the values of the internal temperature sensor connected to the appliance (**sensor1Value.0**) and then of the values returned by external sensor probes connected to it.

In this example we added an external temperature & humidity probe to it. By clicking on a field, you can see the matching OID for that field at the top. In above example the OID for the humidity reading is **.1.3.6.1.4.1.17095.3.10.0**

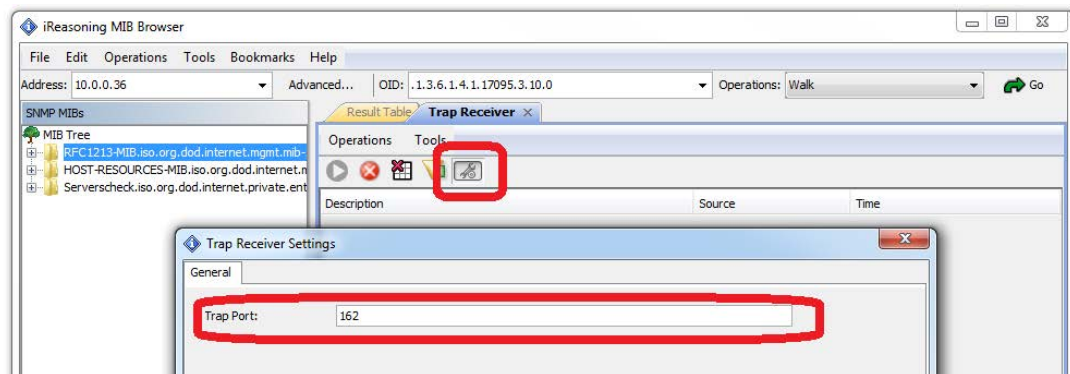
9.2. SNMP Traps

When threshold values are exceeded or on failure (water detection or power failure), the SensorGateway can send out SNMP Traps to network management systems.

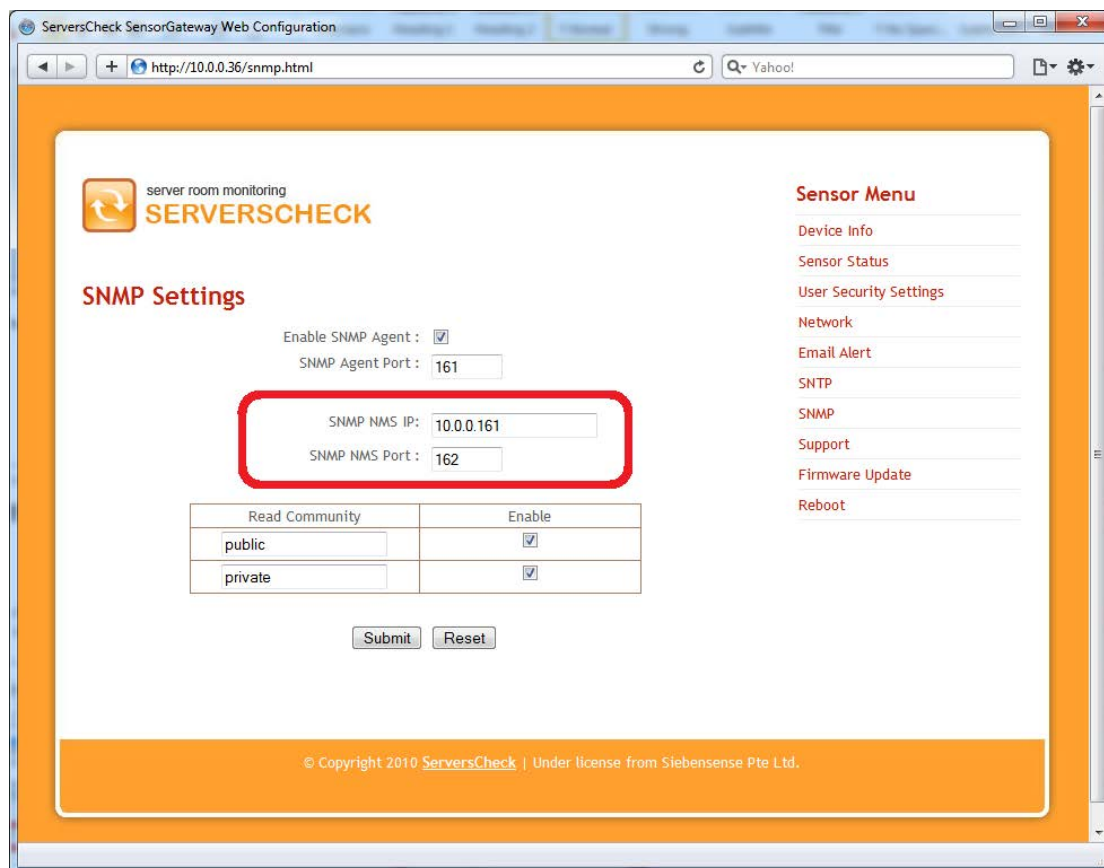
On our system we have installed the iReasoning MIB Browser. Go to **Tools > Trap Receiver**



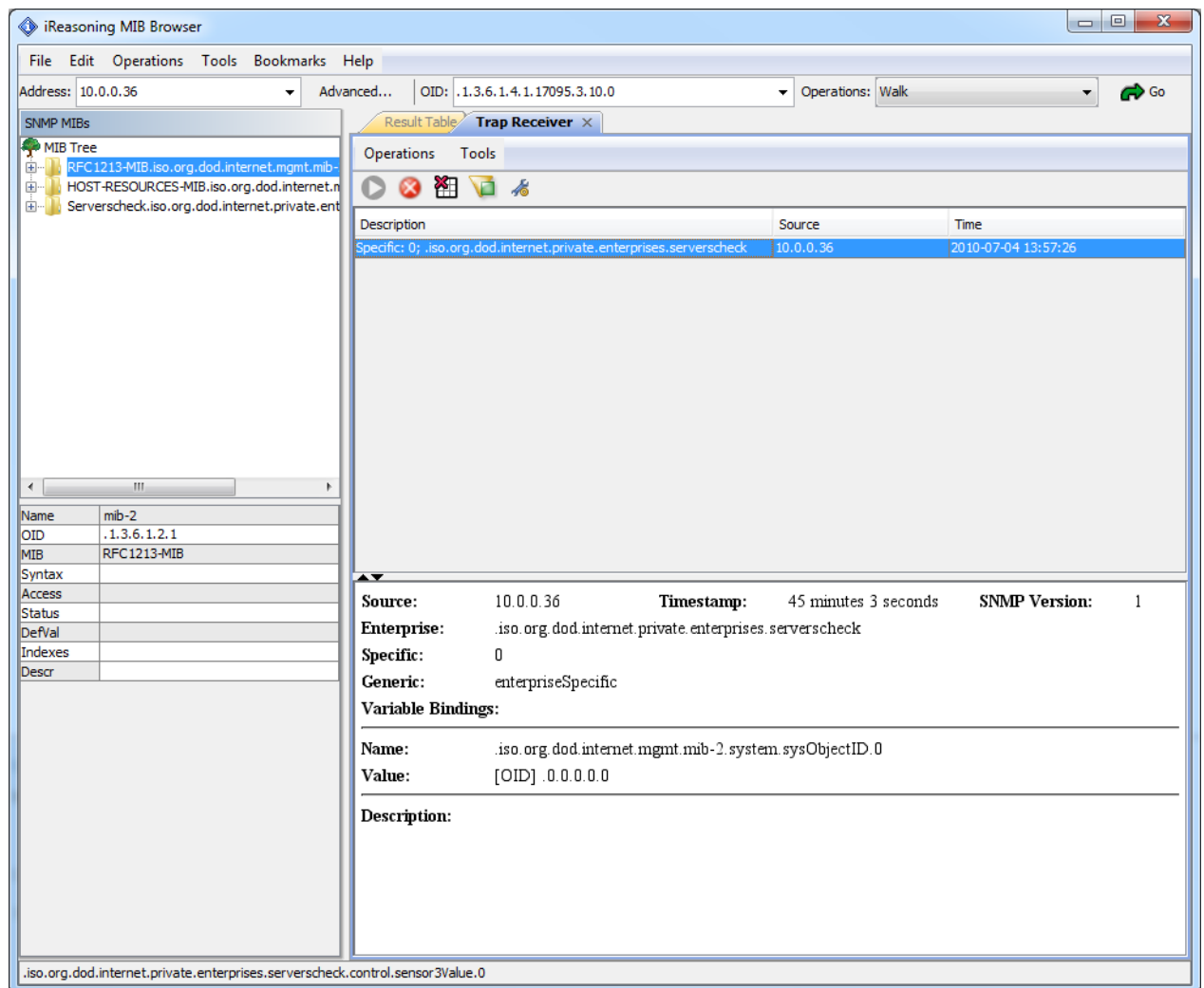
Set the Trap Receiver Port. This is the UDP port used by the SNMP Trap Receiver to receive incoming messages. In our example we set it to 162



In the SensorGateway we now need to define the IP address of the system on which the SNMP Trap Receiver runs and the port to use. Those settings can be found in the **SNMP** menu option



Click on the **Submit** button when done. The SensorGateway will now send a test SNMP Trap to the Trap Receiver (iReasoning in this example).



Above shows the SNMP Trap as received by iReasoning MIB Browser

10. Email alerting from SensorGateway

The ServersCheck sensors can generate autonomous alerts via SNMP Traps and also via email.

To setup email alerting, click on the **Email Alert** tab on the right hand side menu.

The screenshot shows a web browser window titled "ServersCheck SensorGateway Web Configuration" with the address bar displaying "http://10.0.0.36/email.html". The page has an orange header with the "SERVERSCHECK" logo and "server room monitoring" text. On the right, a "Sensor Menu" lists various options: Device Info, Sensor Status, User Security Settings, Network, Email Alert (highlighted), SNMP, Support, Firmware Update, and Reboot. The main content area is titled "Email Alert" and contains the following fields and controls:

- Email Alert Enable: ☒
- SMTP Server: [Redacted]
- SMTP Port: 25
- SMTP Authentication: ☒
- SMTP Username: [Empty]
- SMTP Password: [Empty]
- From address: Sensor@ServersCheck.com
- To: demo@serverscheck.com
- Cc: [Empty]
- Email Subject: ServersCheck Sensor Alert
- Email Body: Sensor in Rack 1 has an issue!

At the bottom of the form are "Submit" and "Reset" buttons. A footer at the very bottom of the page reads: "© Copyright 2010 ServersCheck | Under license from Siebensense Pte Ltd."

This screen consists of 3 main parts:

- Mail server settings
- Mail heading settings (from, to, subject ...)
- Mail content (body)

For email alerting, ServersCheck supports standard outgoing mail servers like the ones used by ISP's (SMTP relay servers) or corporate SMTP mail servers requiring standard username & password authentication. SSL mail servers are not supported. For use of SSL, web-based emails are recommended.

In some cases it may happen that you don't have a non-SSL server available in your network or from your ISP. In such situations, we have 3 alternative solutions that may fix the issue.

10.1. Gmail as E-mail Server

In order to use GMAIL as a mail server, you need to have a Gmail account and port 25 should not be blocked by your ISP. If it is blocked by your ISP and your ISP doesn't offer an 'open' mail server then see option 9.2. below

Email Alert Enable : ☒

SMTP Server :

SMTP Port :

SMTP Authentication : ☐

SMTP Username :

SMTP Password :

From address :

To :

Settings are:

SMTP Server: **aspmx.l.google.com**

SMTP Port: **25**

SMTP Authentication: **Off / Unchecked**

From address: yourgmailname@gmail.com

To address: same as from address

The emails will arrive in your SPAM filter unless you whitelist the IP address on Gmail from which you are sending the alerts.

For SSL, the settings will be:

SMTP Server: **smtp.gmail.com**

SMTP Port: **465**

SMTP Use SSL: **Checked**

SMTP Authentication: **Checked**

SMTP Username/Password: **Filled out**

From/To address: Filled out. Not required to be the same.

Note: Only version 5 SensorGateways are supported with Gmail's SSL ever since they offered RSA 2048-bit encryption.

10.2. Tunneling an SSL connection

You can use STunnel to allow non-SSL devices such as the SensorGateway to connect to a secure mail server. STunnel should be running on a computer in your network that is up 24/7. The SensorGateway will connect to STunnel using non-SSL SMTP then STunnel will bridge the connection to for example Google Apps using an SSL connection. STunnel can be downloaded from: <http://www.stunnel.org/>

Your stunnel.conf file should look like:

```
-- begin stunnel.conf --
cert = stunnel.pem
socket = l:TCP_NODELAY=1
socket = r:TCP_NODELAY=1
client = yes

[pop3s]
accept = 110
connect = pop.gmail.com:995

[imaps]
accept = 143
connect = imap.gmail.com:993

[ssmtp]
accept = 25
connect = smtp.gmail.com:465
-- end stunnel.conf --
```

10.3. Mail service like AuthSMTP.com

If you don't have a non-SSL mail server on your network and you don't want to use stunnel and you can't use Gmail because your operator blocks it, then we could recommend AuthSMTP.com which provides a solid SMTP relay service.

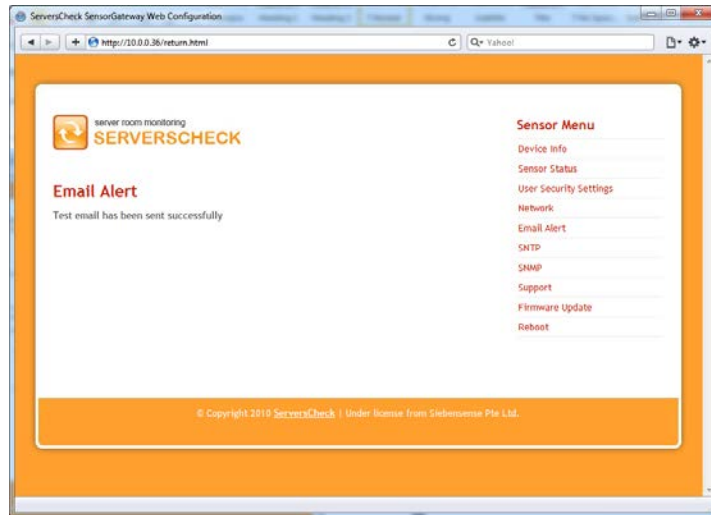
With AuthSMTP.com you can subscribe to use their relay servers on a port such as 2525 while using standard authentication (non-SSL).

More information on <http://www.authsmtp.com>

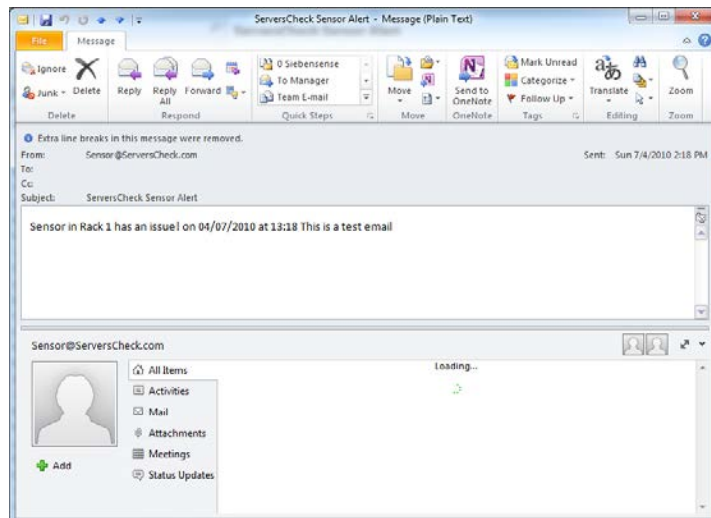
If you need to send alerts to multiple recipients, then the best option is to create a group in your mail server to send out the email alerts to multiple people.

In the email body we suggest to put in the location of the sensor. When you have multiple sensors, a user easily knows where to look for when receiving the alert.

When done click on the **Submit** button. It will now try to send a test message to the mail account.



Below is the test email as received in Outlook 2010.



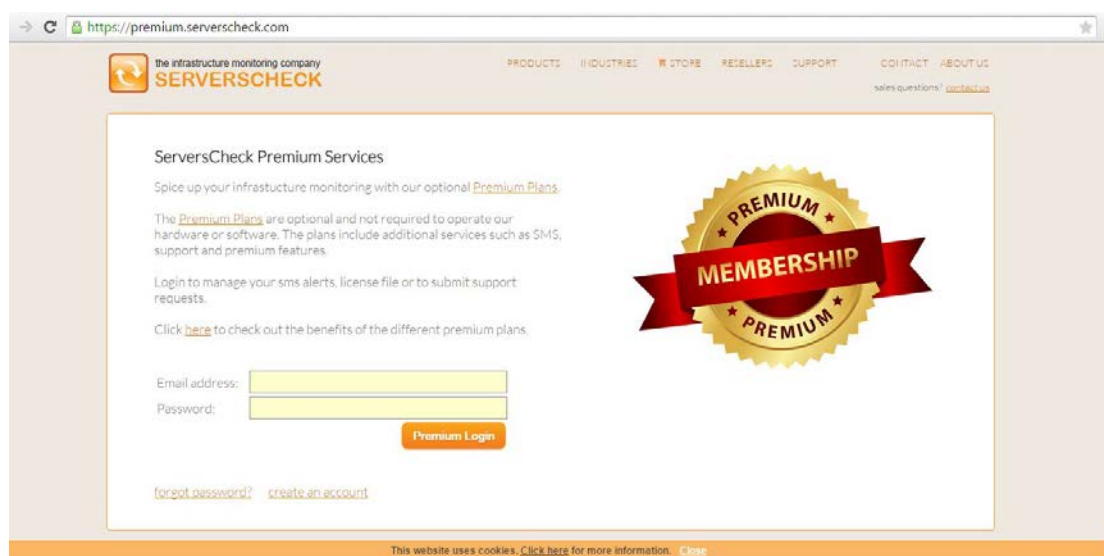
11. SMS alerting from SensorGateway

Requirements for SMS alerting:

- An active account created on <https://premium.serverscheck.com>
- An active Premium Plan
- Firmware 2.10 or higher on SensorGateways
- Outbound communication on port 80 from SensorGateway to Internet

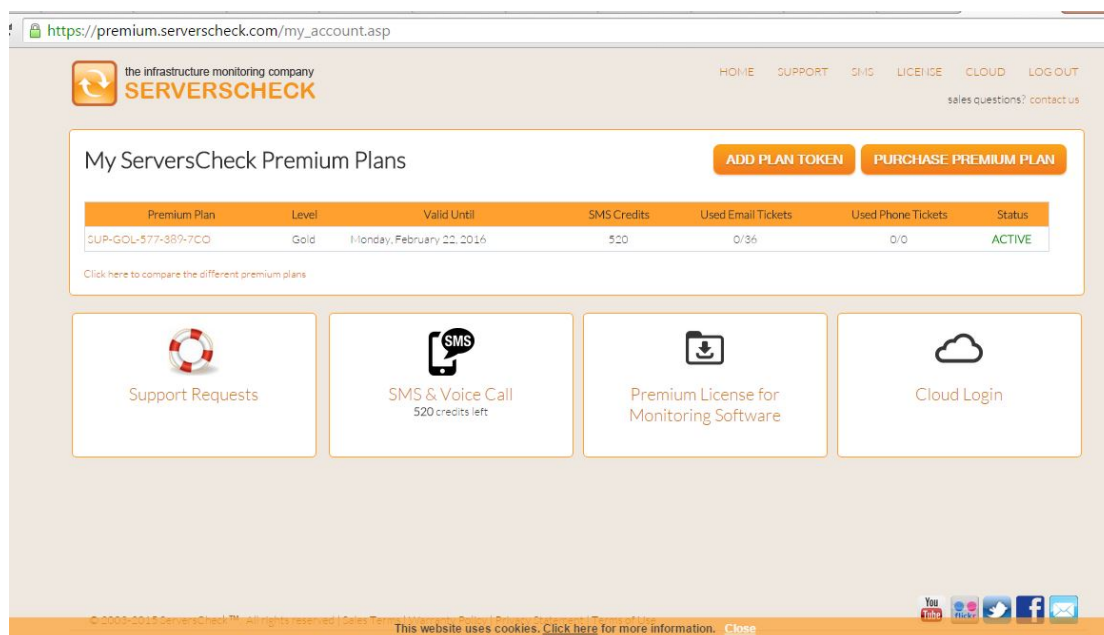
For SMS alerting SMS messages are sent by ServersCheck's SMS Gateway. SensorGateways make a connection over TCP/IP with the SMS Gateway servers for delivering SMS messages.

As per above requirements you need to create an account first on <https://premium.serverscheck.com>



The screenshot shows the 'ServersCheck Premium Services' login page. It features a gold 'PREMIUM MEMBERSHIP' seal on the right. The main content area includes a login form with fields for 'Email address' and 'Password', and a 'Premium Login' button. Below the form are links for 'forgot password?' and 'create an account'. The page header includes the ServersCheck logo and navigation links: PRODUCTS, INDUSTRIES, STORE, RESELLERS, SUPPORT, CONTACT, ABOUT US. A footer note states: 'This website uses cookies. Click here for more information. Close'.

When you have completed above steps to create your account, then you will receive an email with your username and temporary password to login.



The screenshot shows the 'My ServersCheck Premium Plans' account page. It features a table of premium plans and four service tiles: Support Requests, SMS & Voice Call, Premium License for Monitoring Software, and Cloud Login. The table has columns for Premium Plan, Level, Valid Until, SMS Credits, Used Email Tickets, Used Phone Tickets, and Status. The first row shows a Gold plan with 520 SMS Credits and an ACTIVE status. The page header includes the ServersCheck logo and navigation links: HOME, SUPPORT, SMS, LICENSE, CLOUD, LOG OUT. A footer note states: 'This website uses cookies. Click here for more information. Close'.

Premium Plan	Level	Valid Until	SMS Credits	Used Email Tickets	Used Phone Tickets	Status
SUP-GOL-577-387-7CO	Gold	Monday, February 22, 2016	520	0/36	0/0	ACTIVE

Note: A Premium plan is required for the SMS & Voice feature, Please do check our plans so you would see what is best for you by clicking on the purchase premium plan link on your account home page.

To check for the configuration and remaining SMS/Voice Call Credit we need to click on the “SMS & Voice Call” Icon in the middle of your Home page.

premium.serverscheck.com/sms/

the infrastructure monitoring company
SERVERSCHECK

HOME SUPPORT SMS LICENCE CLOUD LOG OUT
sales questions? contact us

Premium Plan	Level	Valid Until	SMS Credits	Used Email Tickets	Used Phone Tickets	Status
SUP-GOL-577-889-7CO	Gold	Monday, February 22, 2016	520	0/36	0/0	ACTIVE

Click here to compare the different premium plans

Generate new UID & PIN

SMS UID: 9C567BAFC84041E - PIN: 19486

Last 10 alert messages | Show more alerts history | Credits history

Date & Time	Sent to	Alert Type	Message
11/19/2014 7:43:14 AM	+92475558669	VOICE	* TEST: This is sample voice call alert
11/17/2014 12:31:29 PM	+92475558669	DMG	* Admin Portal Amazon - Administration Server changed to OK at Mon Nov 17 12:29:14
11/17/2014 12:31:28 PM	+92475558669	DMG	* Admin Portal Amazon - Administration Server changed to OK at Mon Nov 17 12:29:14
11/17/2014 12:21:36 PM	+92475558669	DMG	* Admin Portal Amazon - Administration Server changed to DOWN at Mon Nov 17 12:19:
11/17/2014 12:21:35 PM	+92475558669	DMG	* Admin Portal Amazon - Administration Server changed to DOWN at Mon Nov 17 12:19:
11/14/2014 7:51:33 PM	+92475558669	DMG	* Partners Portal - Public Web Servers changed to OK at Fri Nov 14 19:49:19 2014.
11/14/2014 7:51:32 PM	+92475558669	DMG	* Partners Portal - Public Web Servers changed to OK at Fri Nov 14 19:49:19 2014.

This website uses cookies. [Click here for more information.](#) [Close](#)

You need to note down the following configuration info: the **UID** and **PIN** codes. These have to be entered in the SensorGateway in order to have the SMS alerting work.

From the above personal page you can check your SMS credits status, Upgrade into New Plans or check your SMS alerting history. You can also add additional SMS recipients if you want SMS alerts to be send to multiple mobile numbers.

Now connect to your SensorGateway and click on the **SMS Alert** menu option

ServersCheck SensorGateway Web Configuration - Mozilla Firefox

File Edit View History Bookmarks Tools Help

10.0.0.XX/sms.html

ServersCheck SensorGateway Web Conf...

server room monitoring
SERVERSCHECK

SMS Alert setting

Enable SMS : ☒

UID : 0DD049CD8BA94

PIN :

You can find your UID and PIN code in the SMS Alerting portal.
Click [here](#) to access / create your account.

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Sensor Menu

- Device Info
- Sensor Status
- User Security Settings
- Network
- SMS Alert
- Email Alert
- SNTP
- SNMP
- Support
- Sensor Calibration
- Firmware Update
- Reboot

Activate the **Enable SMS** option by clicking on the checkbox. Then enter the **UID** and **PIN** from your account page. Click on the **Submit** button

It will now send a SMS test alert to your cell phone.

Didn't you receive the SMS test alert? Verify your network settings especially if the DNS server has been configured correctly in the **Network** menu settings. If the DNS server has been correctly defined then make sure that no firewall is blocking outgoing HTTP calls from the SensorGateway to the ServersCheck SMS Gateway.

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS/Voice	SNMP Trap	Trigger Output	Set Output State To
	Internal Temp	Temp	internal temp	30.17 °C	< 15 or > 35	< 10 or > 40	☐	☐	☒	☐	Output4 ▾	ON ▾

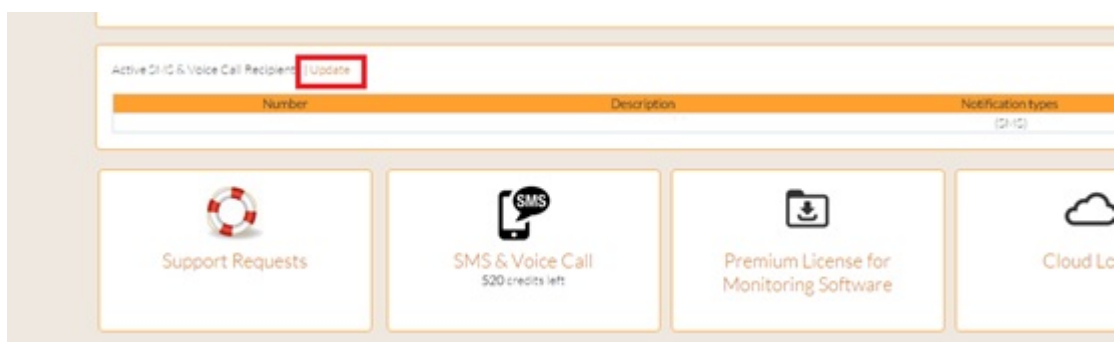
Now click on the SMS checkbox to receive alerts via SMS for the item you are monitoring.

12. Voice Call Alerts

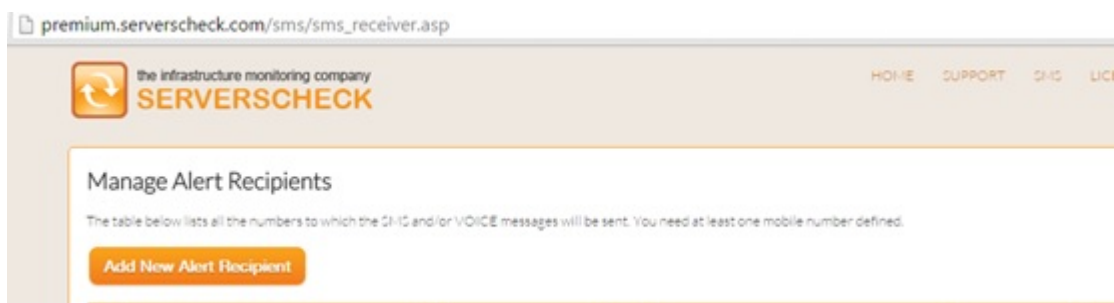
Aside from SMS messages, ServersCheck also offers voice calls as an alert by using text-to-speech technology. This feature could be utilized to monitor your mission-critical environments and/or devices. It works by dialing the recipient's number then informing him/her of the error message.

Voice call alerts are configured on the SMS portal and can be used by purchasing the same credits used for your SMS alerts.

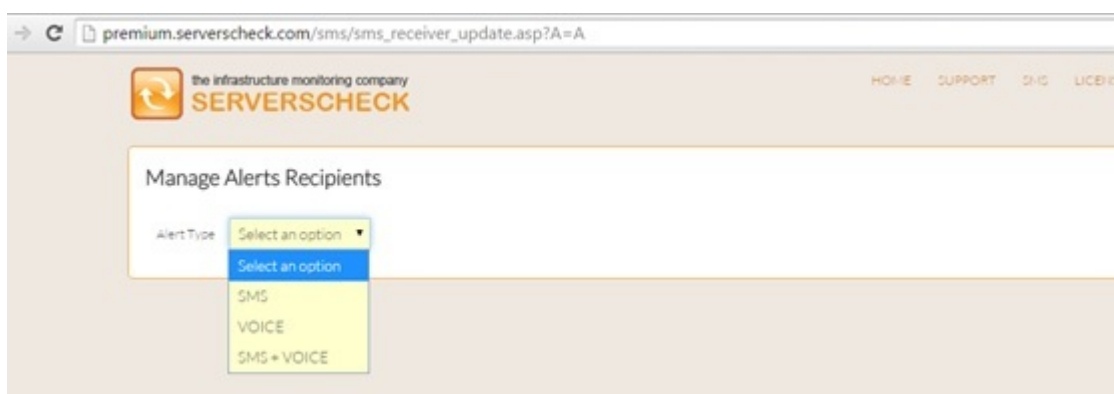
To get started, add a new recipient by proceeding to the "Alert Recipients" page of the SMS portal. From there, as seen on the screenshot below, you'll have to choose the alert type for the new recipient which can be for SMS, voice call, or both.



Click on the update link then, click on add new recipient.



Then select Voice



After which, you'll have to verify the added number by clicking the "Activation Pending" link as seen below.

Number	Alert Type	Description	Status	Actions
	SMS VOICE		Activation Pending	edit/e> delete
	VOICE		Active	edit/e> delete

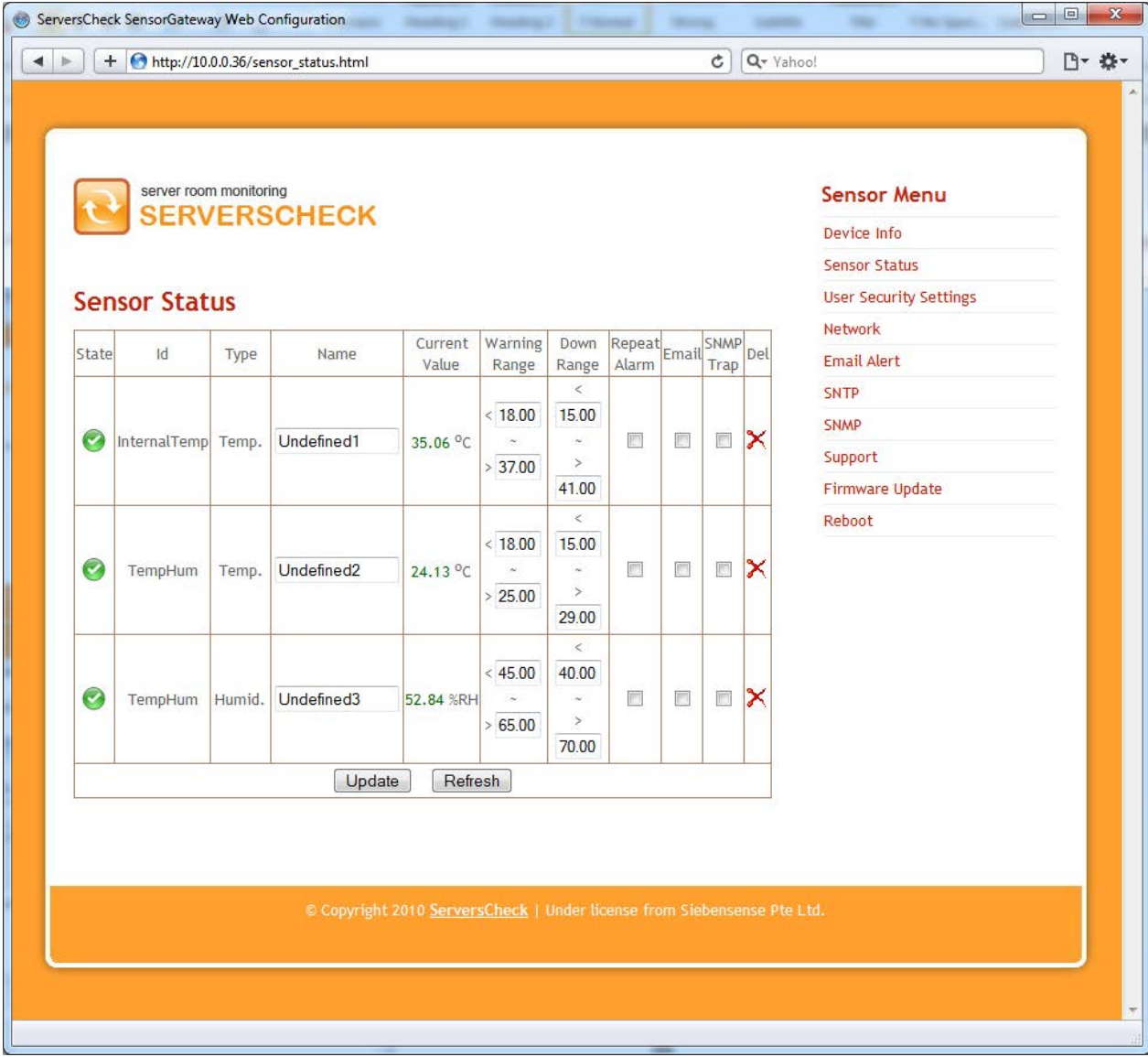
Once activated, we'll have to go the SensorGateway's web page to specify the sensors where you want the voice call alert to be used. In order to do so, make sure the SMS alert option on the "Sensor Status" page is ticked.

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS	SNMP Trap
	Internal Temp	Temp	Temp-Int	44.34 °C	< 18.1 or > 30.1	< 15.1 or > 40.1	☐	☐	☒	☐

Depending on the active recipients on the SMS portal, each time the specified sensor sends an alert, you will receive an SMS and/or voice call alert(s). If the active recipient(s) is only enabled for SMS, then you'll only be receiving an SMS alert. If voice, then voice, and if both, then both.

13. Setting threshold values in the SensorGateway for alerting

Connect to the SensorGateway and click on the **Sensor Status** menu option.



Sensor Status

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SNMP Trap	Del
✓	InternalTemp	Temp.	Undefined1	35.06 °C	< 18.00 ~ > 37.00	< 15.00 ~ > 41.00	☐	☐	☐	✗
✓	TempHum	Temp.	Undefined2	24.13 °C	< 18.00 ~ > 25.00	< 15.00 ~ > 29.00	☐	☐	☐	✗
✓	TempHum	Humid.	Undefined3	52.84 %RH	< 45.00 ~ > 65.00	< 40.00 ~ > 70.00	☐	☐	☐	✗

Update Refresh

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State: this shows if the internal sensor or the external sensor probe is working or not

Id: identifier of type of sensor

Type: type of reading for the sensor

Name this is the name of the sensor and will be used in alerting

Current value: this is the latest reading for both the internal sensor and the external sensor probe

Warning range: below the minimum value and above the maximum value a WARNING alert will be sent. Current value color will change to orange

Down range: below the minimum value and above the maximum value a DOWN alert will be sent. Current value color will change to red. DOWN overrules WARNING

Repeat alarm: when set then this will trigger an alert to be sent every 5 minutes

Email: when checked then email alerts will be sent for this sensor value

SNMP Trap: when checked then a SNMP Trap will be this value

Delete: removes the value from the list. It can't be undone and will require to restore to factory defaults.

14. Logging

14.1. Alert Log

Alert Log : Download All >HERE<

2013/11/26 07:00:17	Recover	temp2	25.00
2013/11/26 07:00:14	Warning	temp2	25.06
2013/11/26 07:00:05	Recover	temp2	25.00
2013/11/26 06:59:59	Warning	temp2	25.06
2013/11/26 06:59:55	Recover	temp2	25.00
2013/11/26 06:59:49	Warning	temp2	25.06
2013/11/26 06:59:46	Recover	temp2	25.00
2013/11/26 06:58:39	Recover	temp3	25.00
2013/11/26 06:58:36	Warning	temp3	25.06
2013/11/26 06:58:21	Recover	temp3	25.00
2013/11/26 06:58:17	Warning	temp3	25.06
2013/11/26 06:58:11	Recover	temp3	25.00
2013/11/26 06:57:59	Warning	temp3	25.06
2013/11/26 06:57:56	Recover	temp3	25.00
2013/11/26 06:57:46	Warning	temp3	25.06
2013/11/26 06:57:43	Recover	temp3	25.00
2013/11/25 19:48:04	Warning	temp3	25.06
2013/11/25 19:48:01	Recover	temp3	25.00
2013/11/25 19:47:36	Warning	temp3	25.06
2013/11/25 19:47:33	Recover	temp3	25.00

Alert Log

User Security Settings

Network

Email Alert

SMS Alert

SNTP

SNMP

Support

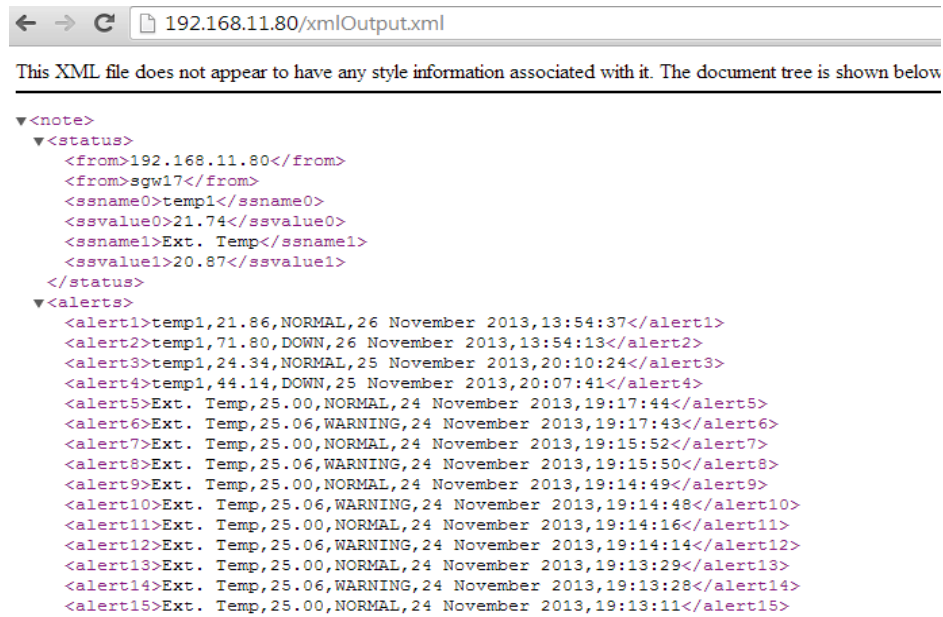
Sensor Calibration

Firmware Update

Reboot

Each time a threshold is hit, an entry is automatically recorded on the log. And as seen on the screenshot, recovery alerts are also included. The SensorGateway is able to store up to 2048 entries and are downloadable in CSV format. On column F of the CSV file, the following legend is used for the alerts - 0:Recovery; 1:Warning; 2:Down.

14.2. XML Output

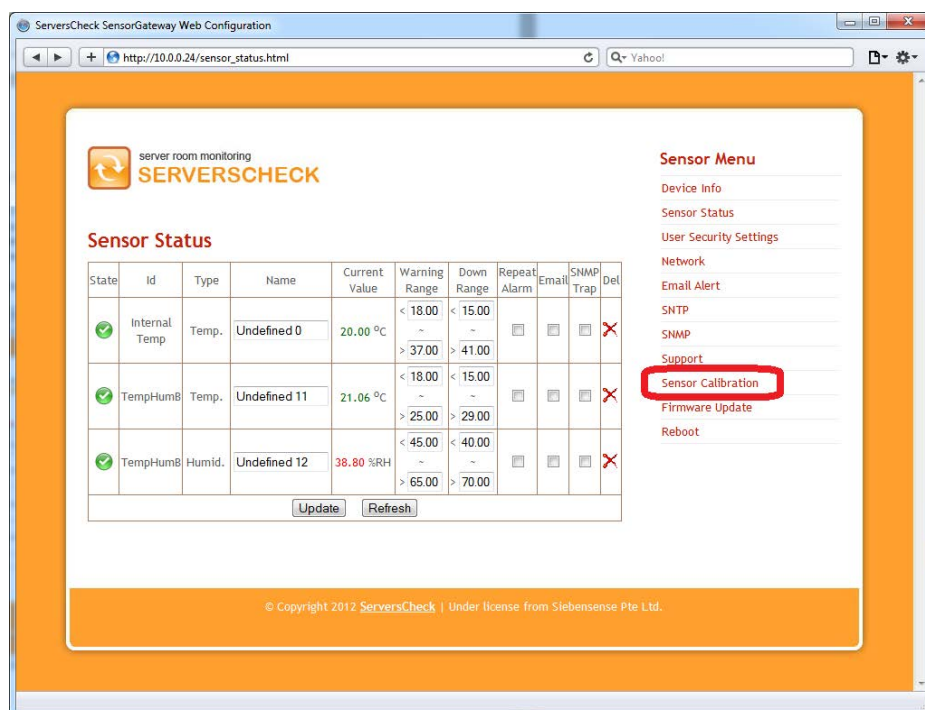


The log can be accessed by appending *xmlOutput.xml* at the end of the SensorGateway's IP address/FQDN as seen on the screenshot. More than the alerts, it also gives you the current status of the device. This option shows the latest 500 alert entries.

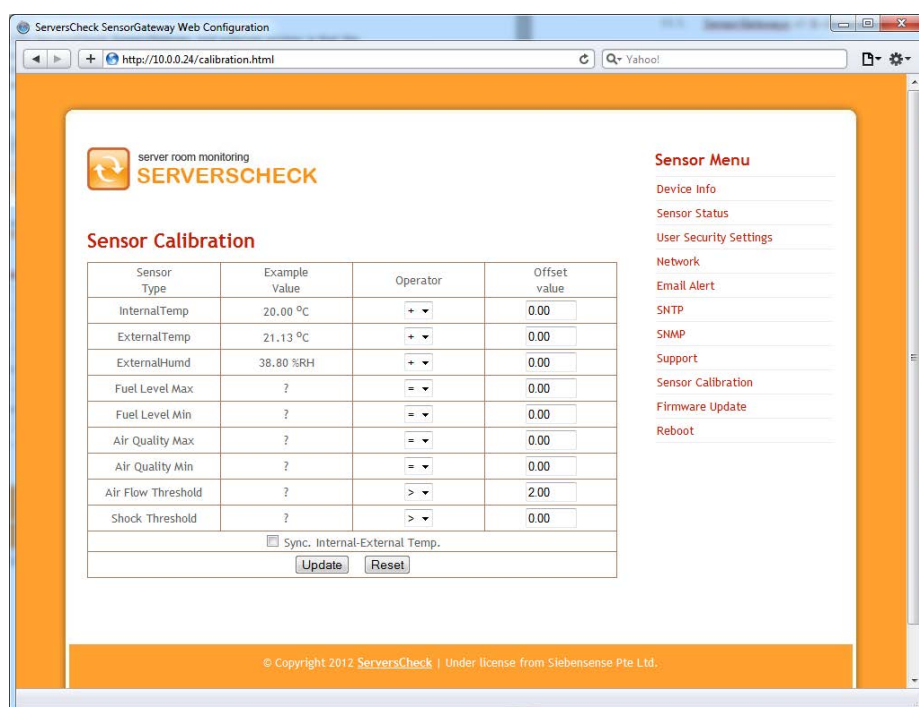
15. Sensor Calibration

A unique feature of the ServersCheck SensorGateway and external probes is that the SensorGateway has a calibration feature available from the web interface. This feature allows to correct temperature and humidity readings based upon, for example a NIST Traceable measurement system.

To recalibrate the built-in or external probes, click on the **Sensor Calibration** menu option of the main screen.



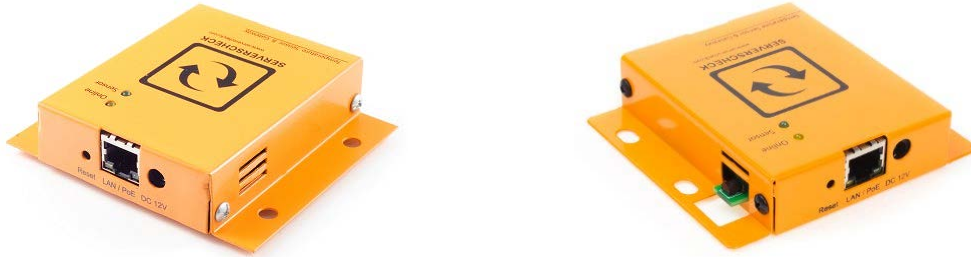
Adjust your sensor readings by modifying the offset value (either + or -) and click on **Update**.



16. Factory resetting of SensorGateway

16.1. SensorGateways v1 and v2

Following only applies to SensorGateways v1 & v2 - the matching models are shown below



You can always hard reset the SensorGateway to its default factory settings as follows.

Resetting the device to factory default will result in all settings to be lost



- 1) Plug in power adapter or PoE cable
- 2) Within 2 seconds from plugging the power adapter or PoE cable, push the **Reset** button with a pen or similar and hold it for 5 seconds before releasing it.
- 3) Wait until the yellow LED doesn't blink anymore
- 4) Reconnect to the SensorGateway's web interface at <http://192.168.11.160>

16.2. SensorGateways v3 and v4

Following only applies to SensorGateways v3 and v4 - matching the picture below

Kindly note that due to a mistake in the boot loader of v3 units, the internal system specifications show it as a v2 unit. However those are v3 units (or v4 for dual sensor probes) when they match the picture below.

You can always hard reset the SensorGateway to its default factory settings as follows.

Resetting the device to factory default will result in all settings to be lost



- 1) Remove the external sensor probe
- 2) Remove the power adapter or PoE cable
- 3) Push the **Reset** button
- 4) While the **Reset** button is pushed, plug in the power adapter or PoE Cable
- 5) After 10 seconds the Green & Yellow led's will be on steady (not blinking)
- 6) Remove power adapter or PoE cable
- 7) Wait 3 seconds
- 8) Plug in power adapter or PoE cable
- 9) After a few seconds both Green & Yellow led's are blinking
- 10) Reconnect to the SensorGateway's web interface at <http://192.168.11.160>

16.3. 16.3. SensorGateway v5

Following only applies to SensorGateways v5

Resetting the device to factory default will result in all settings to be lost

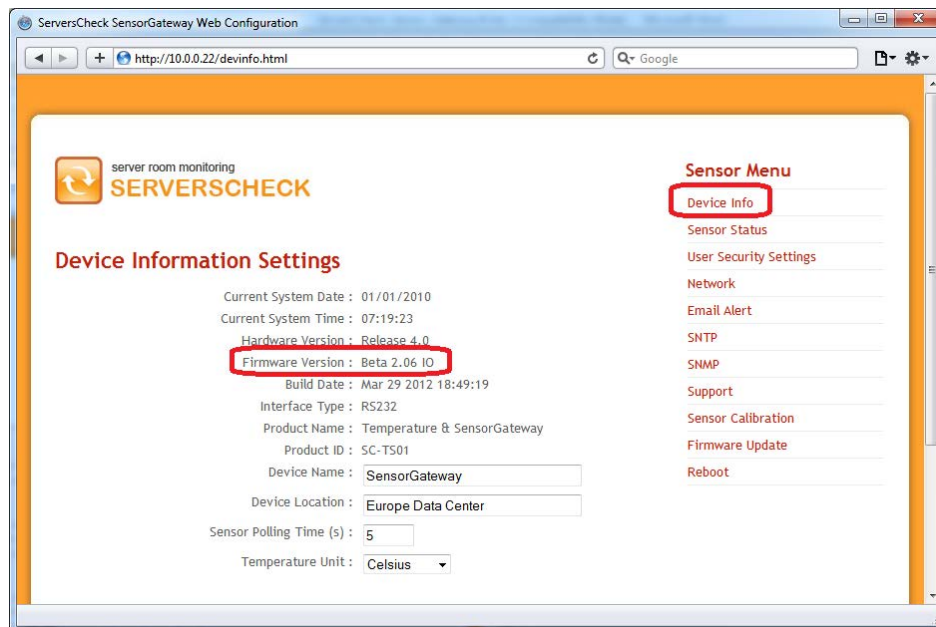


- 1) Remove the external sensor probe
- 2) Remove the power adapter or PoE powered network cable
- 3) Push the **Reset** button
- 4) While the **Reset** button is pushed, plug in the power adapter or PoE powered network cable
- 5) Hold it for 5 seconds before releasing it. The yellow LED should be blinking fast.
- 6) Wait until the yellow LED is not blinking fast anymore.
- 7) On the LED display, the Sensorgateway will reboot. After a few seconds both Green & Yellow led's should be flashing slowly.
- 8) While the PoE or power adapter is plugged in, push the **Reset** button
- 9) Hold it for 5 seconds before releasing it.
- 10) On the LED display, the Sensorgateway will reboot. After a few seconds both Green & Yellow led's should be flashing slowly .
- 11) Reconnect to the SensorGateway's web interface at **<http://192.168.11.160>**

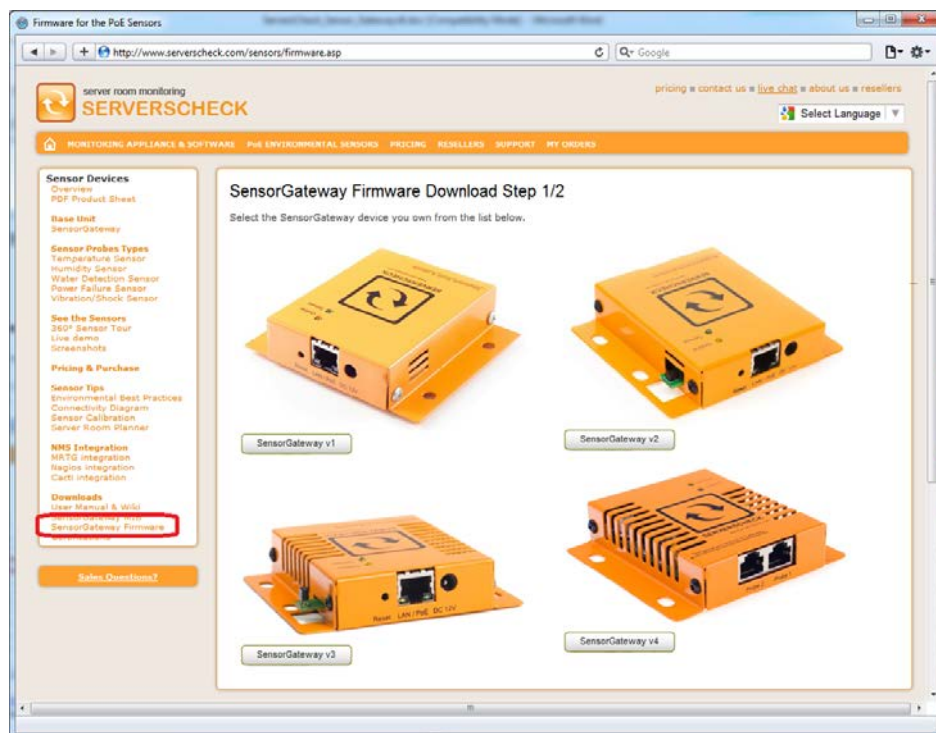
17. Updating the firmware of the SensorGateway

ServersCheck may release from time to time new firmware versions for its SensorGateways.

You can check your currently installed firmware version by going to your SensorGateway and then clicking on **Device Info**

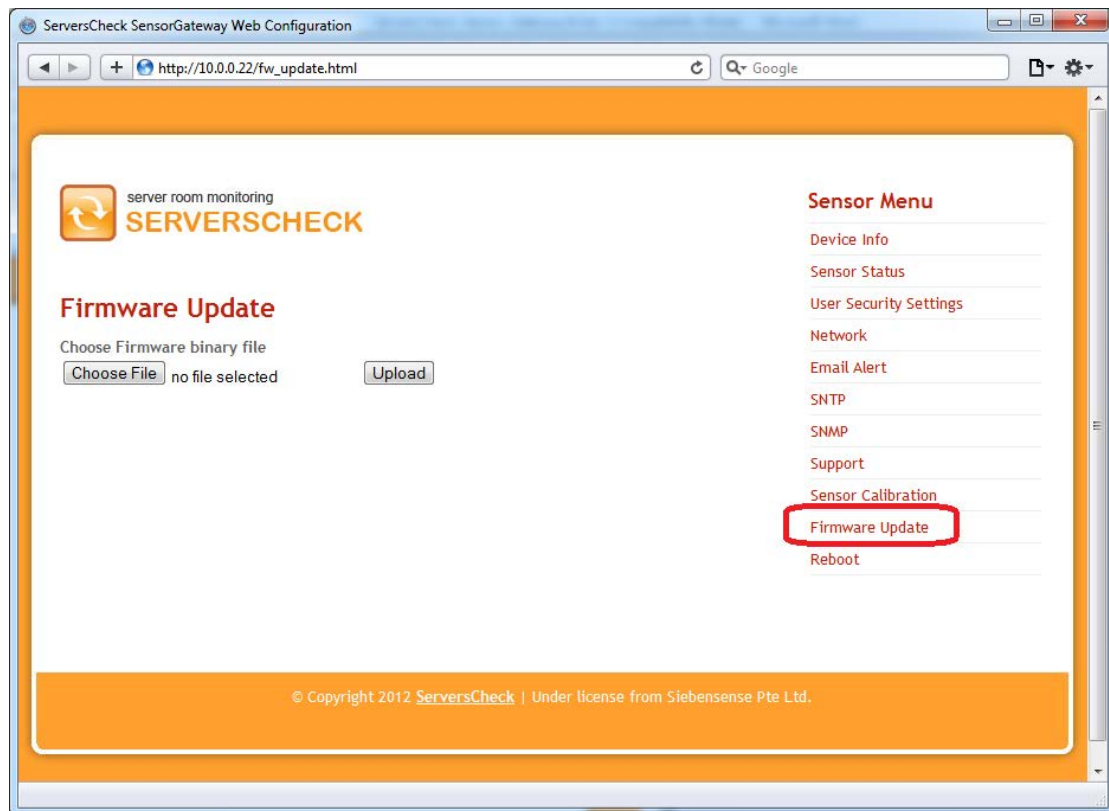


Go to <http://www.serverscheck.com/sensors/firmware.asp> to check for new firmware releases. Simply check on that page the latest firmware version available for your SensorGateway



Download the firmware to your PC and then go with your browser to the SensorGateway you wish to upgrade.

Click on the **Firmware Update** menu option and then click on the **Choose File** button to locate the downloaded firmware file. Only then click on the **Upload** button.



Your SensorGateway will now start loading the new firmware. Your SensorGateway will be available on <http://192.168.11.160> after the firmware update has been completed

Should the upgrade fail and should the SensorGateway be unresponsive then perform a factory reset as described in section 12 of this document.

18. SensorGateway's LED table



The following table details the different led indication combinations. Each combination allows you to visually get the nature of the state/issue

Yellow LED (Network/Online)	Green LED (Sensor)	Description
Flashing (fast, ~1/10 sec)	On	Updating firmware after reboot. Reboot time is about 5 seconds before SensorGateway is ready.
Flashing (slow, ~1 sec)	Any	Can't sync with NTP (time) server
On	Any	Synchronized with NTP (time) server
Any	Flashing	Can't communicate with external sensor probe
Any	On	Connected with external sensor probe

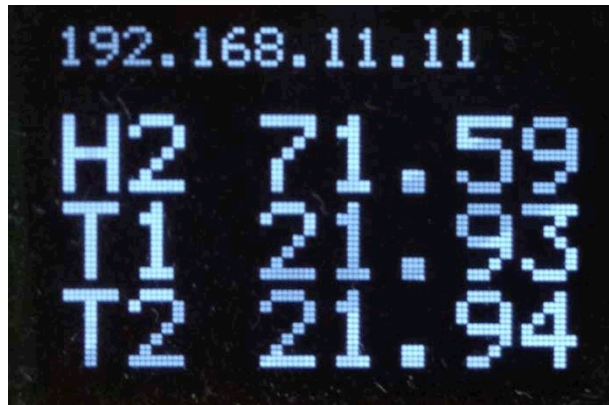
18.1. Normal Power on Reset, No New Firmware Uploaded

- a) Power ON state: Yellow & Green LED are ON for 2 seconds and start flashing
- b) Run state: Yellow & Green LED are both flashing
 - Green LED is ON if able to connect with external sensor probe
 - Yellow LED is ON if able to sync with NTP (time) server

18.2. Reboot, New Firmware Uploaded

- a) Power ON state: Yellow & Green LEDs are ON for 1 second and Yellow LED starts flashing
- b) Updating firmware state: takes around 20 seconds
 - Green LED stays ON
 - Yellow LED will flash very fast (about 1/10 seconds)
- c) Ready state: Yellow & Green LED are both flashing
 - Green LED is ON if able to connect with external sensor probe
 - Yellow LED is ON if able to sync with NTP (time) server

19. OLED Display Subscripts



The OLED display gives one a quick view of the values the SensorGateway is reading. The reference for the order of the subscript numbering is completely dependent on how the web page is showing it. In the photos displayed, the T1 value is referred to be temp1 while T2 is temp3.

✓	Internal Temp	Temp	temp1	21.99 °C
✓	Temperature	Temp	temp3	21.94 °C

20. Rack mounting the SensorGateway

The SensorGateway is an 1U device that can be easily and securely mounted in a rack using standard rack mount screws with Phillips head. Although one screw is sufficient to hold the whole equipment in place, a second one improves stability.

Typically the sensors are mounted at the rear of the rack where ample place is available so that it doesn't use any space reserved for server and other network rack mounted equipment.



21. The IO Sensor Probe – 16 Dry Contacts IN & 4 OUT

21.1. General Description

The IO sensor probe is a 16 zone expander for the Sensorgateway that adds up to 16 dry contacts for sensor alarm detection and indication. It has 4 output lines that can drive sirens and strobe lights. It is also capable of giving a 12 volt power supply and a maximum of 700 mA current capacity, enough to power several sensors and output devices . **Only one IO Sensor Probe per SensorGateway is supported**



21.2. Specifications

SENSOR TYPE:	HARDWIRED, OPEN / CLOSED
OPERATING POWER SUPPLY:	power supply comes from the Sensorgateway
AUXILLARY SUPPLY:	maximum current capacity of 700mA at 12 VDC
NUMBER OF INPUTS:	16
NUMBER OF OUTPUTS:	4
INDICATOR RANGE:	OK / TRIG
POLLING RATE:	can be set from 1 to 5 seconds
COMMUNICATION CABLE:	RJ45 TO RJ45 connector to the Sensorgateway

21.3. Applications

- SNMP interface sensor trigger and status
- SNMP traps sent when a change of state occurred
- SNMP polling for zone/sensor status
- SNMP set capability for OUTPUT purposes
- 12 VDC power source for sensors

21.4. Terminal Description



TERMINAL BLOCKS

DI1 to DI16 : 16 digital inputs
DO1 to DO4 : 4 digital outputs

+12V : 12 VDC supply
GND : supply ground

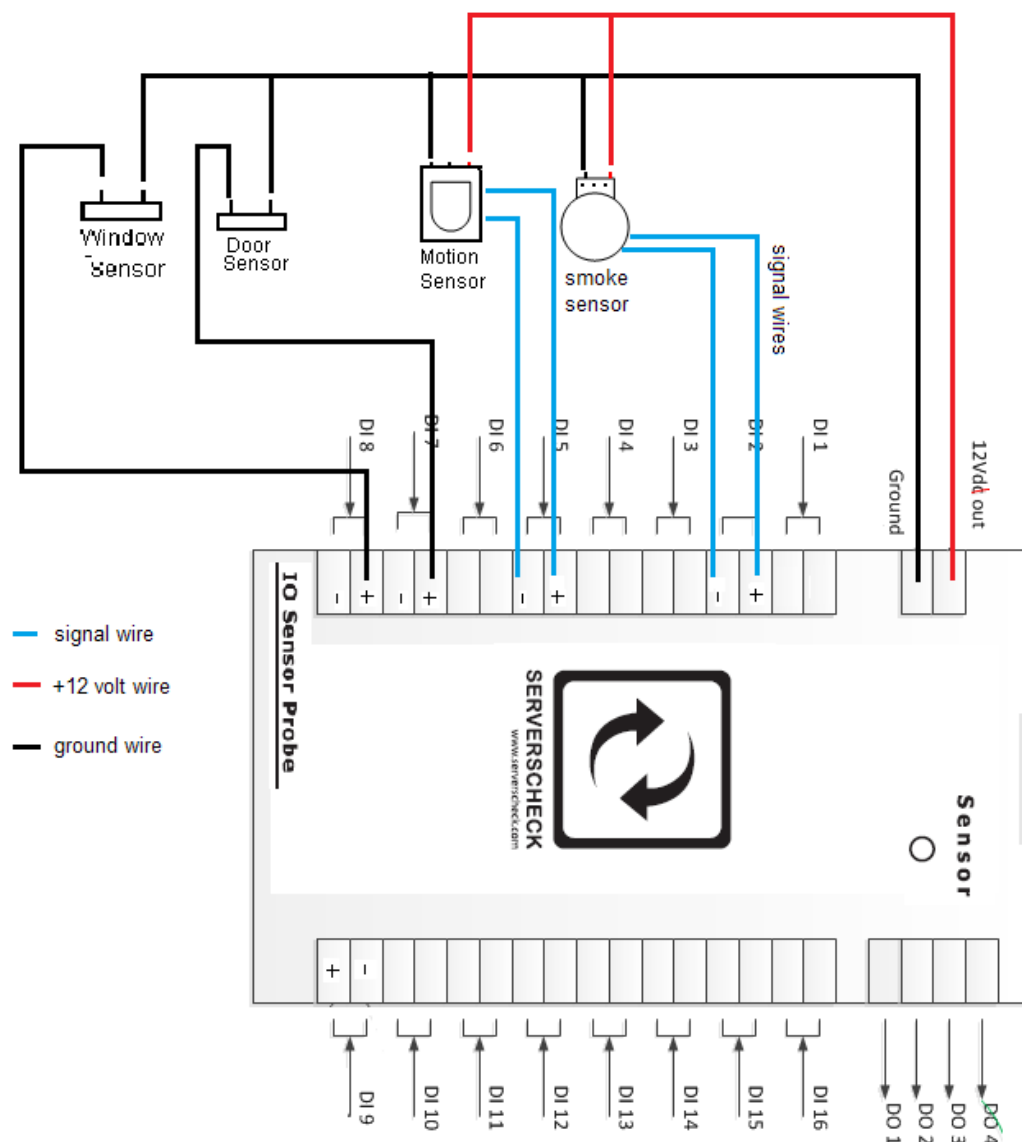
21.5. Mounting instructions

The IO sensor probe is a device that can be easily and securely mounted in a rack using standard rack mount screws with Phillips head. Although one screw is sufficient to hold the whole equipment in place, a second one improves stability.

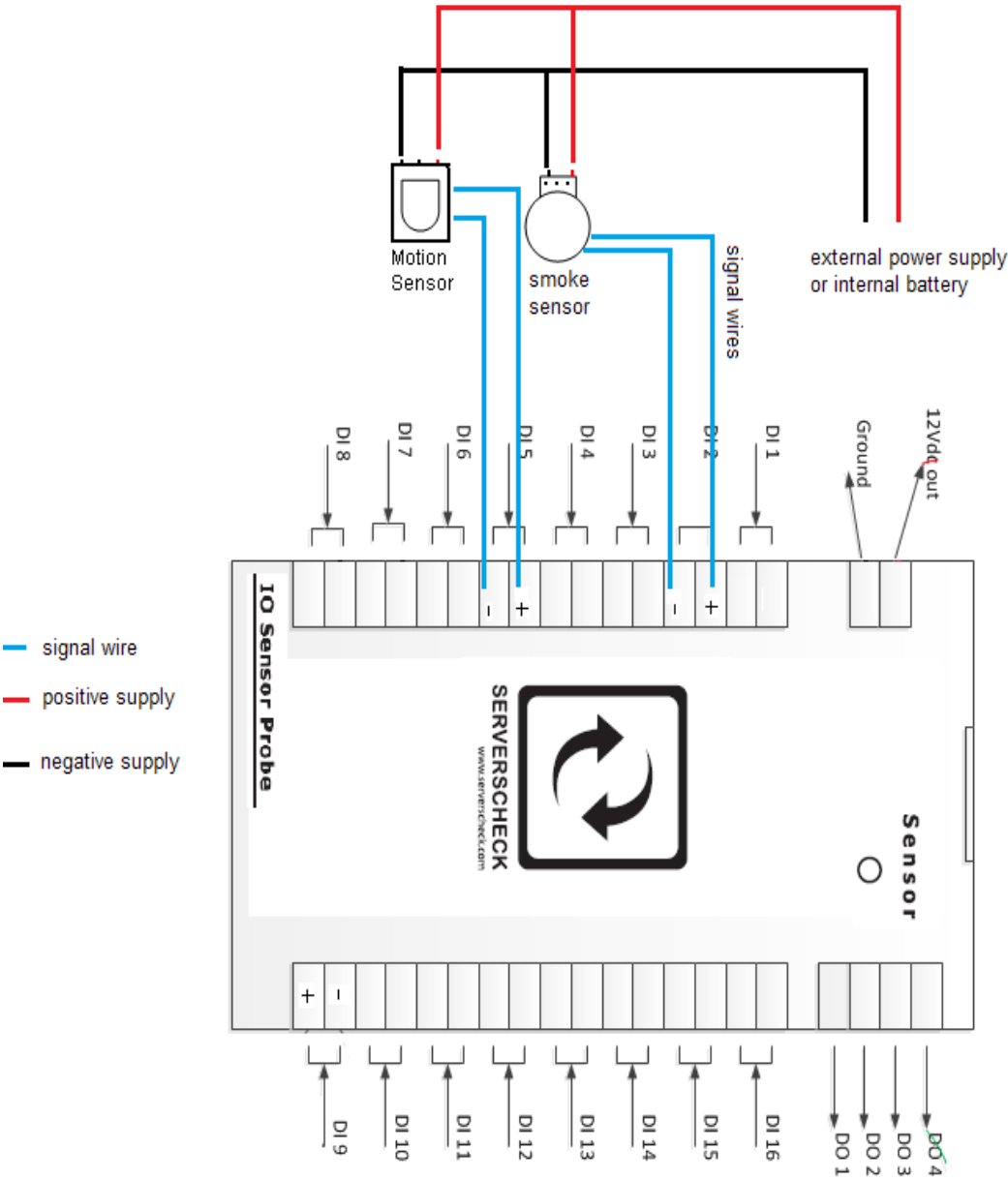
Typically the sensors are mounted at the rear of the rack where ample place is available so that it doesn't use any space reserved for server and other network rack mounted equipment.

21.6. Basic Wiring Diagram

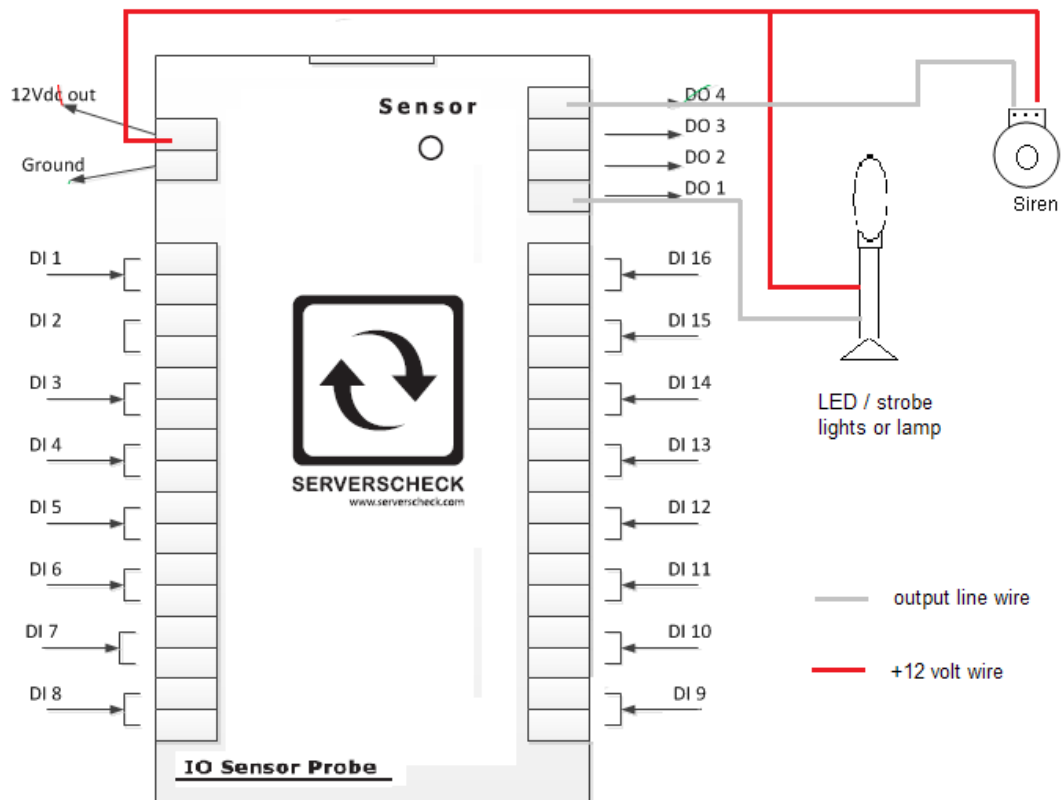
INPUTS: if sensors are getting their power supply from the IO sensor probe



INPUTS: if sensors are getting their power supply from an external source or internal battery



OUTPUTS: to drive a siren, lamp/strobe or any output device



21.7. SensorGateway IO Sensor Probe Interface

Output Control

State	Id	Type	Name	Current Value	Default State	Control Output
	IO Sensor	Output	Output1	OFF	OFF ▼	CYCLE
	IO Sensor	Output	Output2	OFF	OFF ▼	CYCLE
	IO Sensor	Output	Output3	ON	OFF ▼	CYCLE
	IO Sensor	Output	Output4	ON	OFF ▼	CYCLE
Update Reset						

Input Status

Status	DI	Name	Value	Time(ms)	Normal State	Repeat Alarm	Email	SMS	SNMP Trap	Trigger Output	Set Output State To
	1	UndefinelO test 1	OK	500	Open ▼	☐	☐	☒	☐	Output4 ▼	ON ▼
	2	UndefinelO 2	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	3	UndefinelO 3	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	4	UndefinelO 4	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	5	UndefinelO 5	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	6	UndefinelO 6	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	7	UndefinelO 7	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	8	UndefinelO 8	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	9	UndefinelO 9	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	10	UndefinelO 10	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	11	UndefinelO 11	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	12	UndefinelO 12	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	13	UndefinelO 13	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	14	UndefinelO 14	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	15	UndefinelO 15	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
	16	UndefinelO 16	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
Update Reset											

OUTPUT1 TO OUTPUT4

- the default state can be set to either ON or OFF and is used in conjunction with triggers (ex. siren or strobe /lamp)
- CYCLE button is used to switch the button on and then off or vice versa depending on the default state.

NAME

- is used to assign a name to a zone or sensor (ie .. motion1, smoke1, door1)
- Due to memory limitations, make sure that the maximum number of characters on this field doesn't exceed 31.

VALUE

- shows the status of a zone . OK = normal condition, **Trig** = a zone/sensor has been triggered

Time (milliseconds)

- a time period that can be set which serves as a “wait period” before the IO sensor probe considers a change of state of a zone/sensor as an alert or a trigger

Normal State

- this will set the “logic” of the Input on how to define a trigger /change of state coming from the sensors
- it can be set as “open” for normally open (NO) logic or “closed” for normally closed (NC) logic.

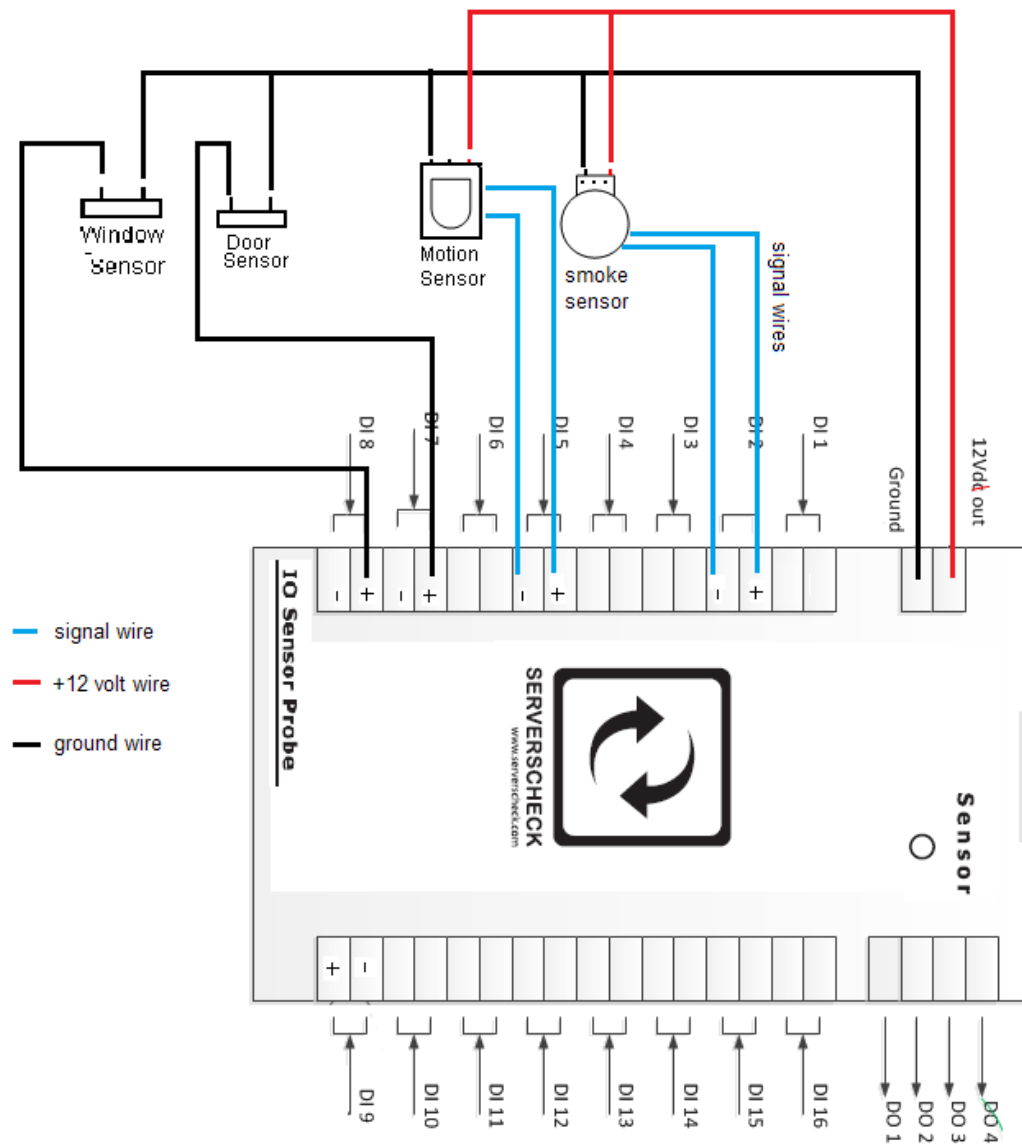
ALWAYS CLICK “UPDATE” AFTER EVERY CHANGE IN VALUES/PARAMETERS for changes to take effect

21.8. Wiring configuration and settings (anti tampering)

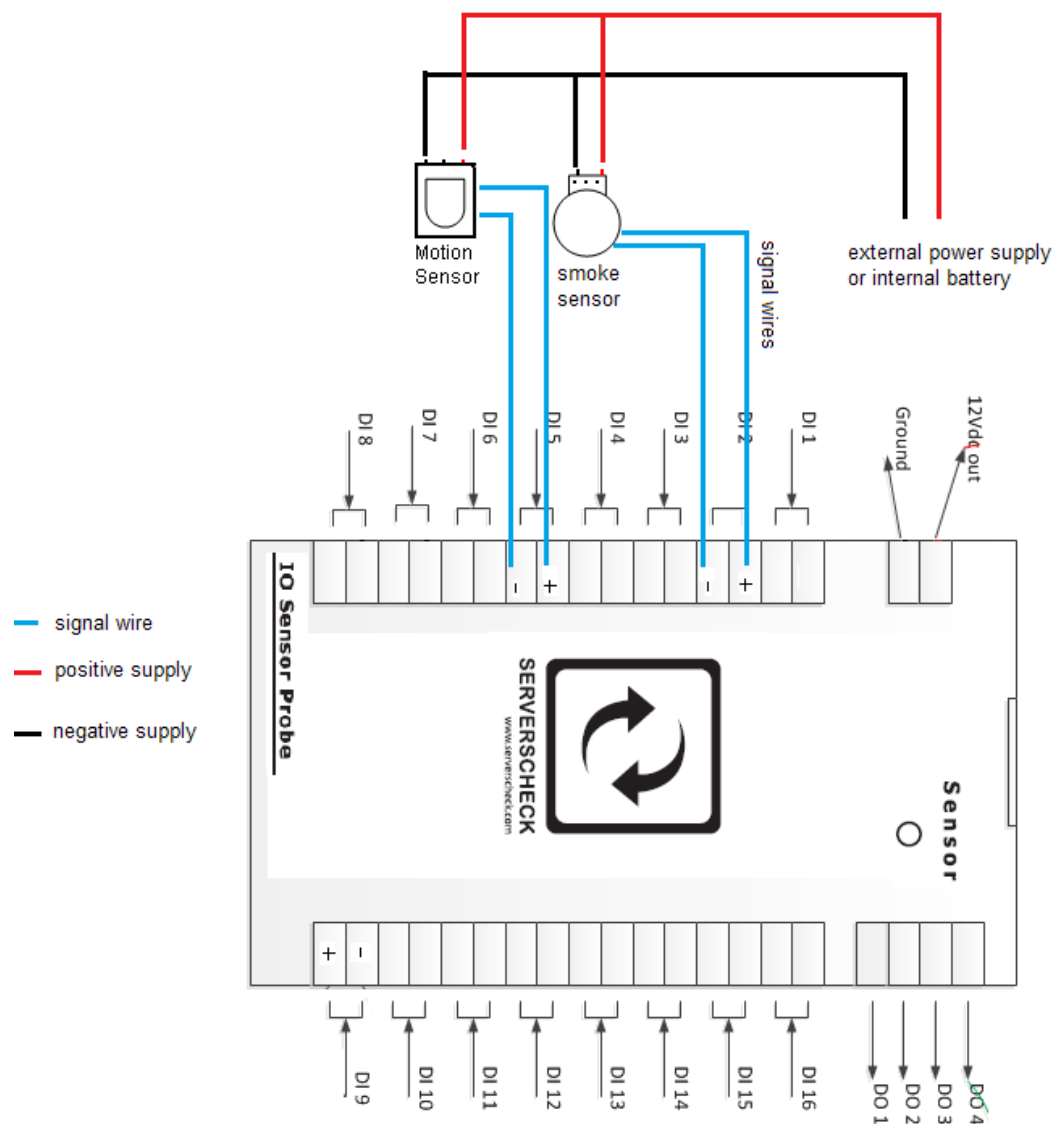
The IO sensor probe does not have the ability to give out specifically a “tamper” alert. But it can be wired and set to give out a “normal” alert if ever a power supply wire or a signal wire was cut off in which case the monitoring team must still attend to.

Basic wiring diagram for Inputs still applies

INPUTS: if sensors are getting their power supply from the IO sensor probe

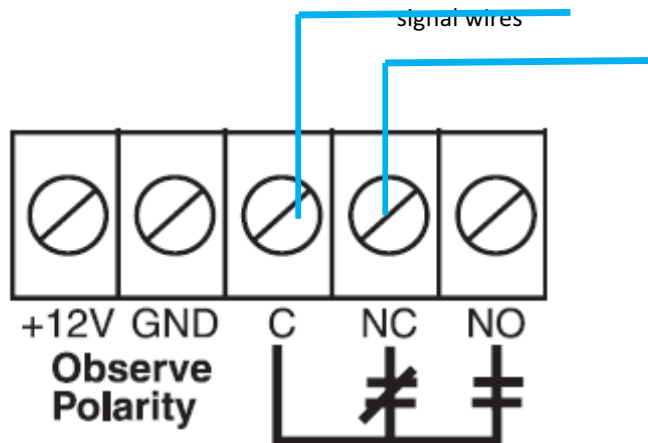


INPUTS: if sensors are getting their power supply from an external source or internal battery



A typical sensor (motion, smoke, CO etc) has dry contacts as its signal output to a control panel (usually located inside of the sensor, at the back or already exposed via 3 wires and a terminal connector)

Connect the signal wires from the IO sensor probe (can be interchanged) to NC and C terminals of the sensor



DRY CONTACT TERMINALS

NO : normally open (open circuit if not triggered / short circuit when triggered)

NC : normally closed (short circuit if not triggered / open circuit when triggered)

C : common (common terminal)

Set the all Normal State to **"Closed"** (setting the trigger logic to normally closed)

I/O Probe Interface

Output Control

State	Id	Type	Name	Current Value	Default State	Control Output
✓	IO Sensor	Output	Output1	OFF	OFF ▼	CYCLE
✓	IO Sensor	Output	Output2	OFF	OFF ▼	CYCLE
✓	IO Sensor	Output	Output3	ON	OFF ▼	CYCLE
✓	IO Sensor	Output	Output4	ON	OFF ▼	CYCLE
Update Reset						

Input Status

Status	DI	Name	Value	Time(ms)	Normal State	Repeat Alarm	Email	SMS	SNMP Trap	Trigger Output	Set Output State To
✓	1	UndefinelO test 1	OK	500	Open ▼	☐	☐	☒	☐	Output1 ▼	ON ▼
✓	2	UndefinelO 2	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	3	UndefinelO 3	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	4	UndefinelO 4	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	5	UndefinelO 5	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	6	UndefinelO 6	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	7	UndefinelO 7	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	8	UndefinelO 8	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	9	UndefinelO 9	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	10	UndefinelO 10	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	11	UndefinelO 11	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	12	UndefinelO 12	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	13	UndefinelO 13	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	14	UndefinelO 14	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	15	UndefinelO 15	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
✓	16	UndefinelO 16	OK	500	Open ▼	☐	☐	☒	☐	DISABLE ▼	- ▼
Update Reset											

The IO sensor probe will be triggered if it detects a “Close circuit” from the Digital Inputs DI1 because its Normal State is configured as Open and vice versa. The sensors are wired in which it will output an “open circuit” if any of them were triggered. Thus, triggering the IO sensor probe a normal alert on that particular zone/sensor

As based on the image above if test 1 is the main AC unit and Output1 is the reserved AC unit when the main AC goes down it is set to trigger reserve AC unit to ON.

If any one of the power supply wire is cut (or both), the dry contact terminal will go to an “open circuit” state . Thus, triggering the IO sensor probe a normal alert on that particular zone/sensor where power was removed

It may not be a “tamper” alert but its is still an alert that will signal a monitoring system that an anomaly has occurred and needs to be checked

IMPORTANT NOTICE WHEN MONITORING VIA SNMP

When monitoring the IO Sensor via SNMP then one should use the SNMP traps feature instead of using the SNMP Get requests. Through SNMP GET one only receives the status of the contact at the time when the request is made. With the SNMP Traps it will trigger an alert as soon as the condition is met

21.9. Output Triggering

The output triggering can toggle between automatic / assigned or manual/direct using the corresponding buttons on the sensor page. This requires firmware 6.00 or higher for the new Logic architecture.

Output Control

State	Id	Type	Name	Current Value	Default State	Control Output
✓	IO Sensor	Output	Output1	OFF	OFF ▼	CYCLE
✓	IO Sensor	Output	Output2	OFF	OFF ▼	CYCLE
✓	IO Sensor	Output	Output3	ON	OFF ▼	CYCLE
✓	IO Sensor	Output	Output4	ON	OFF ▼	CYCLE
				Update	Reset	

Automatic/Assigned Output on Sensor Thresholds

The output triggering (digital and relay) can be set using the assigned threshold on a particular sensor. Simply assign an output from the drop down menu and its state you want it to do. Several sensors can share and be assigned to a particular output.

Sensor Status

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS/Voice	SNMP Trap	Trigger Output	Set Output State To
✓	Internal Temp	Temp	internal temp	30.17 °C	< 15 or > 35	< 10 or > 40	☐	☒	☒	☒	Output4 ▼ DISABLE Output1 Output2 Output3 Output4	ON ▼
✓	Water Detect	Water Detect	Water Detect	DRY	-	SET	☐	☐	☐	☐	Output4 ▼ DISABLE Output1 Output2 Output3 Output4	- ▼
✓	Power fail meter	Power fail meter	PowerFail 2	OK	-	SET	☐	☐	☐	☐	Output4 ▼ DISABLE Output1 Output2 Output3 Output4	- ▼
✓	Security Probe	Security	Security 3	OK	-	CLOSE ▼	☐	☒	☒	☒	Relay1 Relay2	ON ▼
✓	Sound Pressure	Sound	Sound Meter	53.15 dB	< 30 or > 80	< 20 or > 85	☐	☐	☐	☐	DISABLE ▼	- ▼
✓	Shock Sensor	Shock Sensor	Shock5	0.89 G	< 0.7 or > 2	< 0.6 or > 2.5	☐	☐	☐	☐	DISABLE ▼	- ▼
✓	Dust Sensor	Dust	Dust Sensor 1	0 mg/M ³	< 0.2 or > 15	< 0.3 or > 10	☐	☒	☒	☐	DISABLE ▼	- ▼

so to say after meeting a threshold, it can direct a device to either turn on or off

22. Security Sensors

22.1. General Description

ServersCheck's security solution allows detection of doors, motion, and smoke. Underneath all of these security probes is a simple logic that's adjustable to be close or open. Upon setting a given value, the sensor will instantly be triggered once the opposite is detected which will end up sending you an alert on the event that currently occurred. Being adjustable however, means there's room for changes whenever the situation requires you. This allows for maximum flexibility of what defines an alert.

In this figure, the actual probe that's attached is the door sensor with the logic defaulting to *CLOSE*. Upon opening, we see how it is triggered and thus will eventually send alerts depending on the alerting options chosen.

It is important to note that all security probes have the same web interface so it is advisable to attach one at a time and immediately rename it according to your naming conventions.



On the following photos, it is good to keep in mind that the connection from the sensor to the SensorGateway remains the same. For more information, refer to section 2.

22.2. View of Door Sensor



22.3. View of Motion Sensor



22.4. View of Smoke Sensor



23. Sound Sensor

With the data center demanding a very conducive environment for the services it provides, we know that the people making all those possible needs to be safeguarded as well from any anomaly-producing situations.

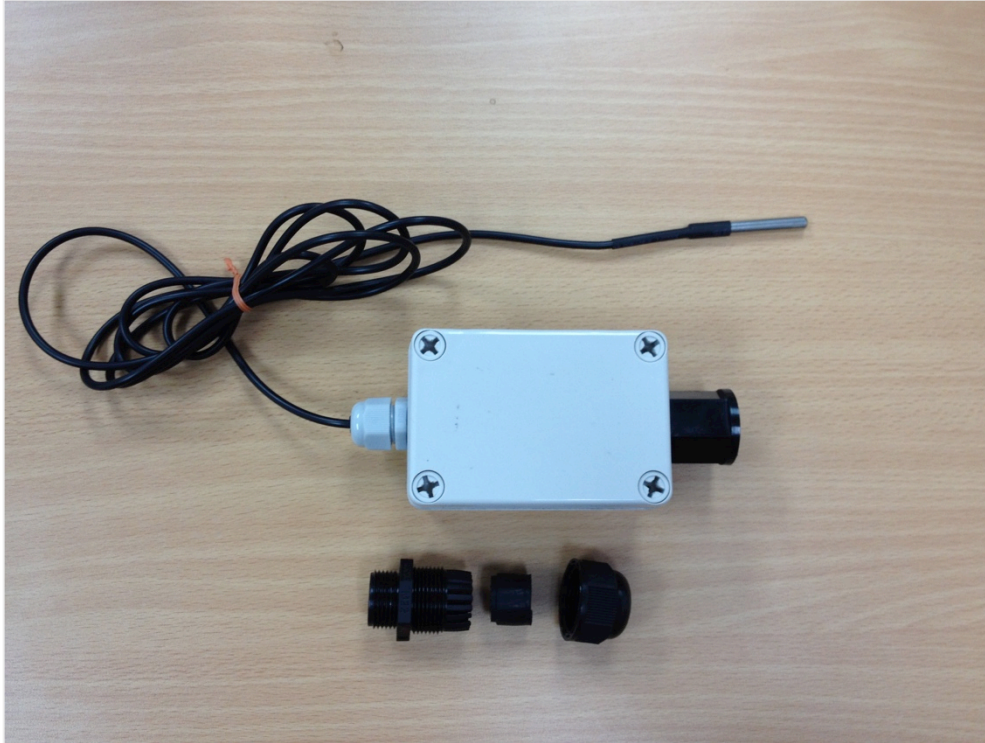
This sensor probe measures sound levels in decibels (dB) which allows you to be notified from a number of noise-producing deviations within your data center. Maximum level allowed is up to 100 dB.

	Sound Pressure	Sound	Sound Meter	49.52 dB	< 35.1 or > 100	< 15.1 or > 80.1	☐	☐	☐	☐
---	----------------	-------	-------------	----------	-----------------------	------------------------	--------------------------	--------------------------	--------------------------	--------------------------

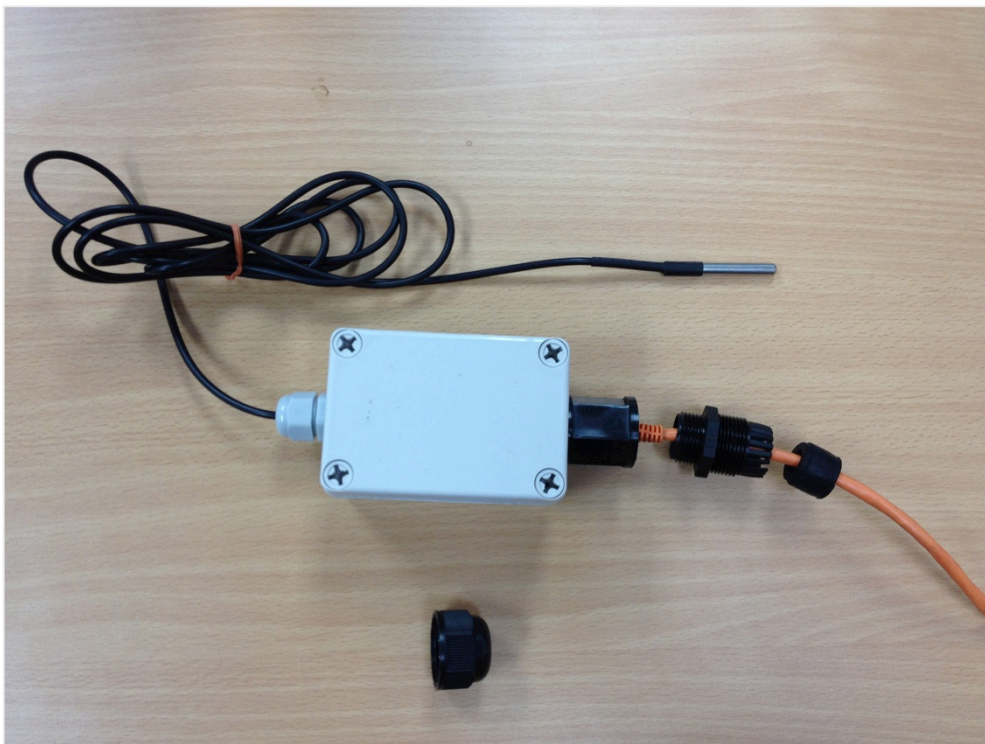


24. Stainless Steel Temperature Sensor & Flooding Sensor Assembly

Out from the box, for the Ethernet connector, you should have the 3 parts that are yet to be assembled: the over-nut, rubber gasket, and contracting gland (from left to right).



To get started, insert the over-nut and rubber gasket in your LAN cable then plug it in on the protruding RJ 45 connector from the sensor probe.



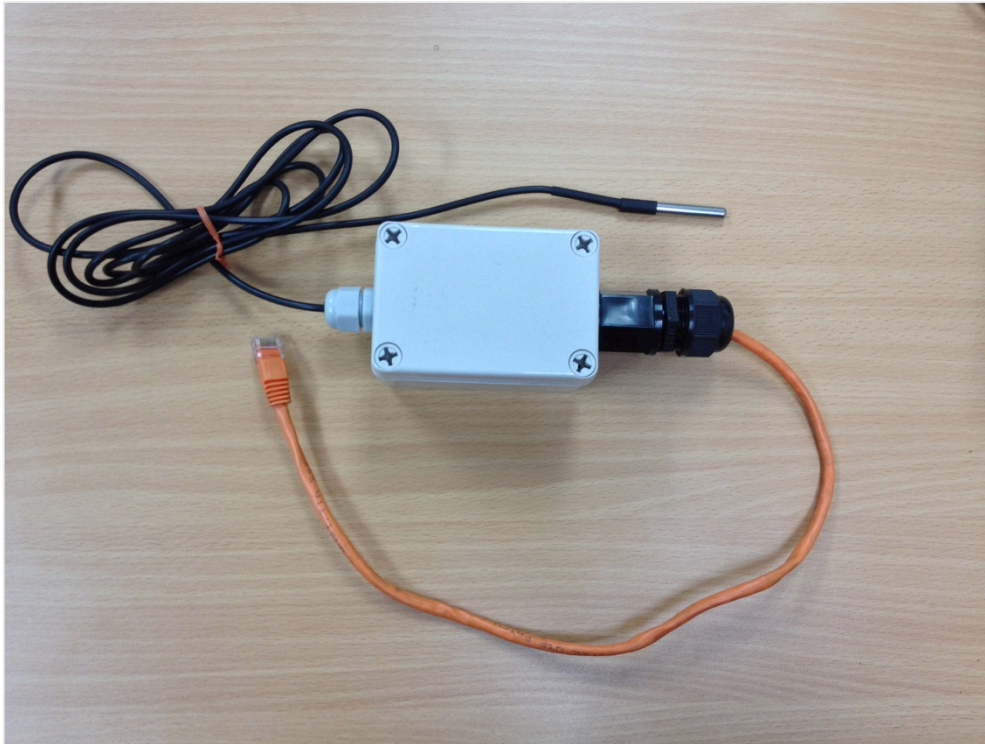
Once that's done, insert the rubber gasket all the way inside the over-nut.



After that, connect them both on the RJ 45 connector of the sensor.



Now that we have that, we just need to insert the contracting gland to seal the Ethernet passthrough. Your stainless steel temperature sensor should now look similar to the following image.



25. The Sensor hub

25.1. General Description

The sensor hub is a port expander attachment / peripheral for the SensorGateway that allows it to accommodate up to 8 sensor probes. It has 4 input dry contacts for sensor alarm detection and indication, 4 output lines that can drive sirens and strobe lights, 2 relay outputs for contact control requirements. It is also capable of giving a 9 to 12 volt power supply and a maximum of 500 mA current capacity, enough to power several sensors and output devices



25.2. Specifications

EXPANSION PORTS :	up to 8 sensor probes
OPERATING POWER SUPPLY:	power supply comes from the SensorGateway
AUXILLARY SUPPLY:	maximum current capacity of 500mA at 9 to 12 VDC
NUMBER OF INPUTS:	4 (dry contacts)
NUMBER OF OUTPUTS:	4 (digital) and 2 relay outputs
POLLING RATE:	can be set from 1 to 5 seconds
COMMUNICATION CABLE:	2 RJ45 cable to the SensorGateway

25.3. Probe Restrictions

- must not be connected with IO sensor probe
- must not be connected with wireless probe
- must not be connected with QoS probe

25.4. Connecting the SensorHub to the SensorGateway

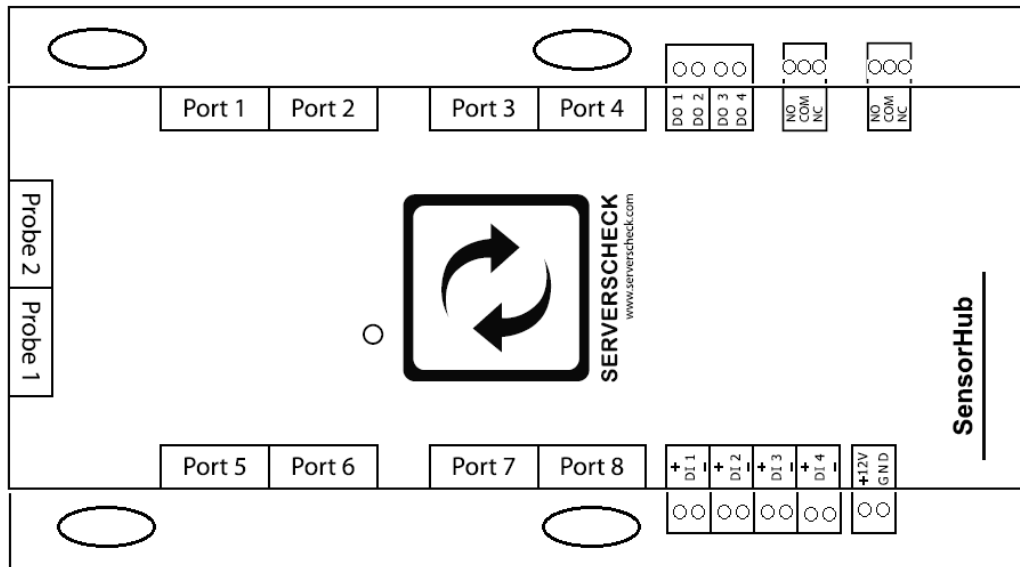


The sensor hub connects through regular RJ45 cables to the SensorGateway. The unit is shipped with 2 short RJ45 cables and a mask plate. You can use longer RJ45 cables if a longer distance is needed.

Plug the first RJ45 cable from on port 1 of the Sensor Hub and on port 1 of the SensorGateway
Then plug in the second RJ45 cable on port 2 of the Sensor Hub and on port 2 of the SensorGateway
If you use the short RJ45 cables shipped with the Sensor Hub, then slide the metal mask plate over the SensorHub and SensorGateway as shown in above picture and the picture below.



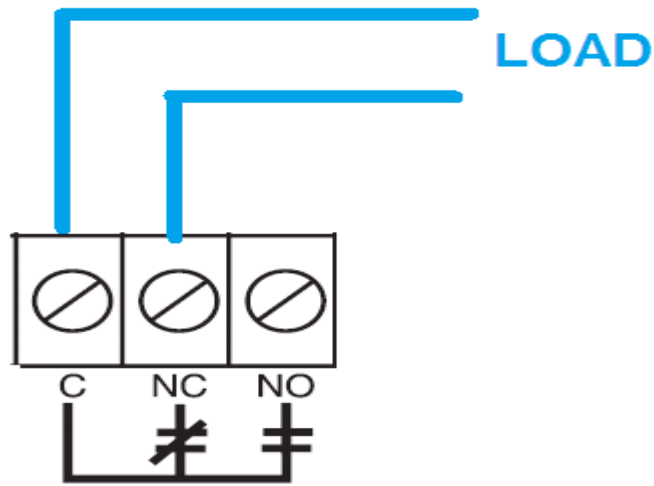
25.5. Terminal Connections



PROBE 1 AND PROBE 2:	connect to SensorGateway using two RJ 45 cables
PORT 1 TO PORT 8 :	connect sensor probes
DI 1 to DI 4:	connect to 4 dry contact inputs
DO 1 to DO 4:	connect to 4 digital outputs
NO, COM and NC:	relay outputs

25.6. Basic wiring

INPUTS (dry contact)	: same wiring diagram as the IO sensor probe for inputs
OUTPUTS (digital)	: same wiring diagram as the IO sensor probe for outputs
OUTPUTS (relay)	: connection to a load will depend on the wiring convention



relay terminals

NO : normally open (always open contact/not connected)

NC : normally closed (always shorted contact/connected)

C : common (common terminal)

25.7. Sensorhub web interface

Expansion of Probes

Sensor Status

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS/Voice	SNMP Trap	Trigger Output	Set Output State To
	Internal Temp	Temp	internal temp	30.29 °C	< 15 or > 35	< 10 or > 40	☐	☒	☒	☒	Output4	ON
	Water Detect	Water Detect	Water Detect	DRY	-	SET	☐	☐	☐	☐	DISABLE	-
	Power fail meter	Power fail meter	PowerFail 2	OK	-	SET	☐	☐	☐	☐	DISABLE	-
	Security Probe	Security	Security 3	OK	-	CLOSE	☐	☒	☒	☒	Relay1	ON
	Sound Pressure	Sound	Sound Meter	54.04 dB	< 30 or > 80	< 20 or > 85	☐	☐	☐	☐	DISABLE	-
	Shock Sensor	Shock Sensor	Shock5	0.88 G	< 0.7 or > 2	< 0.6 or > 2.5	☐	☐	☐	☐	DISABLE	-
	Dust Sensor	Dust	Dust Sensor	0 mg/M ³	> 0.2	> 0.3	☐	☒	☒	☐	DISABLE	-
	Temperature	Temp	Ext. Temp 7	28.37 °C	< 15 or > 35	< 10 or > 35	☐	☒	☒	☐	Relay1	OFF
	Humidity	Humidity	Humidity 7	61.15 %RH	< 50 or > 80	< 45 or > 85	☐	☒	☒	☐	DISABLE	-
	Dew Point	Dew Point	Dew Point 7	20.6 °C	< 12 or > 25	< 10 or > 35	☐	☐	☐	☐	DISABLE	-
	Air Flow	Air FLOW	Airflow1	40 m/s	< 1.5	< 1	☐	☐	☐	☐	DISABLE	-

[Alert History](#)
[Cloud](#)
[User Security Sett](#)
[Wired Network Settings](#)
[Email Alert](#)
[SMS & Voice Call](#)
[SNTP](#)
[SNMP](#)
[Support](#)
[Sensor Calibration](#)
[Firmware Update](#)
[Reboot](#)

INPUTS AND OUTPUTS

Output Control

State	Id	Type	Name	Current Value	Default State	Control Output
	IO Sensor	Output	Output1	OFF	OFF	CYCLE
	IO Sensor	Output	Output2	OFF	OFF	CYCLE
	IO Sensor	Output	Output3	ON	OFF	CYCLE
	IO Sensor	Output	Output4	ON	OFF	CYCLE
	IO Sensor	Relay	Relay1	ON	OFF	CYCLE
	IO Sensor	Relay	Relay2	OFF	OFF	CYCLE

Input Status

Status	DI	Name	Value	Time(ms)	Normal State	Repeat Alarm	Email	SMS	SNMP Trap	Trigger Output	Set Output State To
	1	UndefinedIO test1	OK	500	Open	☐	☐	☐	☐	Output1	ON
	2	UndefinedIO test2	OK	500	Open	☐	☐	☐	☐	Output2	ON
	3	UndefinedIO test3	OK	500	Open	☐	☐	☐	☐	Relay1	ON
	4	UndefinedIO test4	OK	500	Open	☐	☐	☐	☐	Relay2	ON

We will discuss triggering outputs in the next chapter, section 26.

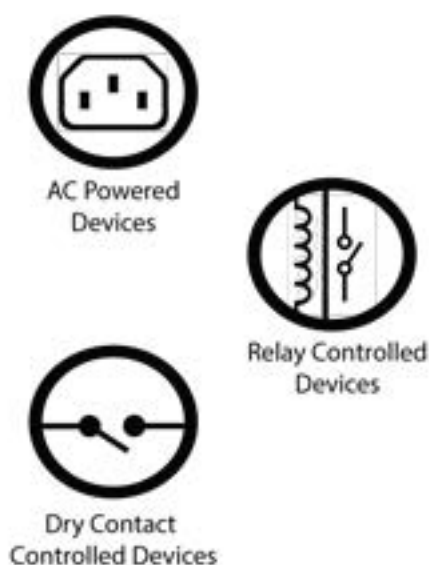
26. Automatic & Remote Control of Equipment

The built-in alerting enables you to be informed when a sensor exceeds defined thresholds or when an incident occurs. Some of these incidents could require an immediate action. For example when the temperature is too high one may want to start a backup cooling unit; or when water is detected then start a pump.

With ServersCheck's infrastructure monitoring solution you can now also control devices: AC, relay or Dry Contact based. Devices can be controlled either by the Sensorgateway in an automatic way (condition based) or remotely through the ServersCheck cloud. In this section we will cover the automatic (condition based) control. For the cloud based control we refer to section 28.4.

Requirement:

To use the control features you need a Sensorgateway with firmware 6 or higher and with an IO sensor or a Sensorhub.



Both the IO sensor and the Sensorhub feature dry contact outputs. However only the Sensorhub feature relay outputs. AC powered devices can be controlled through the optional Power Control sensor which connects to a dry contact port on the Sensorhub.

Important Notice:

The maximum capacity for the SensorHub's relay is 400VAC/150VDC and 200VA/192W. If an output device is to be used that exceeds those specifications, an external relay, i.e. solid-state relay, will have to be used.

26.1. Triggering outputs through the web interface

The output triggering can toggle between automatic / assigned or manual/direct using the corresponding buttons on the sensor page. This requires firmware 6.00 or higher for the new Logic architecture.

Output Control

State	Id	Type	Name	Current Value	Default State	Control Output
✓	IO Sensor	Output	Output1	OFF	OFF ▼	CYCLE
✓	IO Sensor	Output	Output2	OFF	OFF ▼	CYCLE
✓	IO Sensor	Output	Output3	ON	OFF ▼	CYCLE
✓	IO Sensor	Output	Output4	ON	OFF ▼	CYCLE
			Update	Reset		

Automatic/Assigned Output on Sensor Thresholds

The output triggering (digital and relay) can be set using the assigned threshold on a particular sensor. Simply assign an output from the drop down menu and its state you want it to do. Several sensors can share and be assigned to a particular output.

Sensor Status

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS/Voice	SNMP Trap	Trigger Output	Set Output State To
✓	Internal Temp	Temp	internal temp	30.17 °C	< 15 or > 35	< 10 or > 40	☐	☒	☒	☒	Output4 ▼ DISABLE Output1 Output2 Output3 Output4	ON ▼
✓	Water Detect	Water Detect	Water Detect	DRY	-	SET	☐	☐	☐	☐	Output4 ▼ DISABLE Output1 Output2 Output3 Output4	- ▼
✓	Power fail meter	Power fail meter	PowerFail 2	OK	-	SET	☐	☐	☐	☐	Output4 ▼ DISABLE Output1 Output2 Output3 Output4	- ▼
✓	Security Probe	Security	Security 3	OK	-	CLOSE ▼	☐	☒	☒	☒	Relay1 Relay2	ON ▼
✓	Sound Pressure	Sound	Sound Meter	53.15 dB	< 30 or > 80	< 20 or > 85	☐	☐	☐	☐	DISABLE ▼	- ▼
✓	Shock Sensor	Shock Sensor	Shock5	0.89 G	< 0.7 or > 2	< 0.6 or > 2.5	☐	☐	☐	☐	DISABLE ▼	- ▼
✓	Dust Sensor	Dust	Dust Sensor 1	0 mg/M ³	> 0.2	> 0.3	☐	☒	☒	☐	DISABLE ▼	- ▼

****so to say after meeting a threshold, it can direct a device to either turn on or off****

Let's for example configure a scenario where we want to trigger a backup air conditioning unit when the thresholds are exceeded.

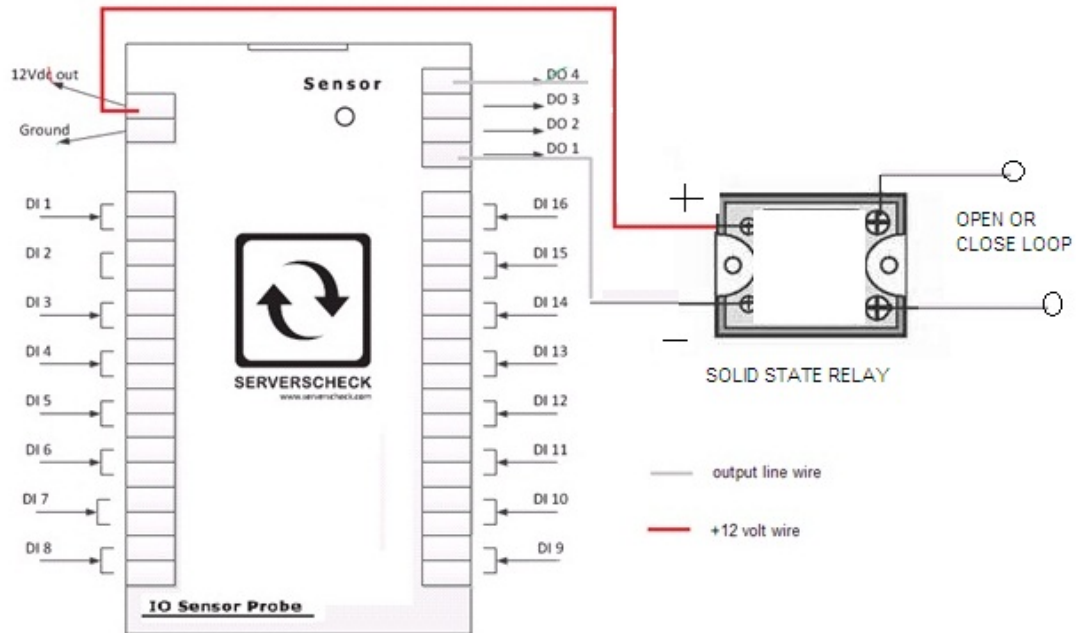
Go to your temperature sensor and select the correct output and the state it should be in, as shown below

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS/Voice	SNMP Trap	Trigger Output	Set Output State To
✓	Internal Temp	Temp	internal temp	30.29 °C	< 15 or > 35	< 10 or > 40	☐	☒	☒	☒	Output4 ▼	ON ▼

- Based on the image, The temp threshold danger levels is when it reaches 40 or above and 10 or less thus will trigger the device connected to the "Output4" to turn ON
- Thus if an Air-condition unit is connected to "Output4" if the temperature rises above 40 it will turn ON automatically

26.2. Wiring for a control output

Now that we have those configured, for the output wiring, kindly refer to 21.6. If an external relay will be used, refer to the following diagram:



27. Mobile SensorGateway

The Mobile SensorGateway is basically the base unit, SensorGateway, with a lot of additional features that's shaped to serve remote sites where, for example, a wired IP connectivity would not be available. And that is solved with the addition of 2G/3G and 4G connectivity.



27.1. Requirements and Specification

Regular sized SIM card, which supports SMS and Data Usage with its Pin Code Deactivated

Supported GSM Mobile frequencies:

GSM | GPRS | EDGE : 850 , 900 , 1800 , 1900 MHz

UMTS|HSPA+ : 900, 1800, 2100 MHz

LTE : 800, 900, 1800, 2100, 2600 MHz

Mobile Certification: CE, GCF

Market: Europe, Middle-East, Africa, Asia, Pacific (for EU frequencies only)

CDMA is not supported.

Operating temperature range: 0°C to +75°C (+167°F)

Operating humidity range: < 90% rH (non-condensating)

Dimensions: 70 mm (2.7") x 88 mm (3.4") x 33 mm (1.4")

TCP/IP: IPv4 at 10/100 Mbps

Power Source: PoE: IEEE 802.3af or optional power adapter

Power Usage: 1500mW (without sensors attached)

Built-in: web server, SNMP v1, v2 & v3 (MD5/AES)

Max distance to switch: depending on cable quality up to 100m / 300ft

27.2. SIM Card

You need a regular sized SIM card with an inactive PIN code. If you have a PIN code activated then ask your mobile operator to deactivate or use any phone to remove it.

The SIM card needs to have a SMS and data plan. Especially when running in “Always Mobile” mode; then we recommend using a postpaid plan and not a prepaid plan. With Prepaid you risk running out of credits resulting in alerts not being sent.

The SIM card is inserted in the slot located on the left side of the device, right under the external temperature probe. The SIM card slot is protected with a metal plate that can be removed with a phillips (cross-head) screwdriver.

We have created a video that details how the mobile sensorgateway should be configured and set up. You can view it on following url:
<https://www.youtube.com/watch?v=ksJw0CpZLb0>



27.3. Internet Connectivity Options

Upon navigating to the “Network Settings” page, you’ll immediately be faced with the added menu namely the “Preferred Connection” and “Connection Check IP” on the top, and the new “Mobile Setting” section at the bottom as shown on the screenshot.

the infrastructure monitoring company
SERVERSCHECK

Preferred Connection: Always Mobile
Connection Check IP: www.google.com

Wired Network Setting

Setting: ☐ DHCP ☒ Fixed

IP Address: 192.168.11.22
Subnet Mask : 255.255.255.0
Gateway : 192.168.11.2

Primary DNS : 8.8.8.8
Secondary DNS : 4.2.2.2

Net BIOS Name : MOBILE_111
Mac Address (HEX) : 00:03:64:03:31:0E

Mobile Setting

GSM Status : Ready: PH Sun Cellular:2G Signal -71 dBm
IMEI : 354311050034258
APN Name : minternet

Submit Reset

Sensor Menu

- Device Info
- Sensor Status
- Alert History
- Cloud
- User Security Settings
- Network Settings
- Email Alert
- SMS Alert
- SNTP
- SNMP
- Support
- Sensor Calibration
- Firmware Update
- Reboot

For the connectivity options, we’ll have 3 as shown on the following screenshot:

the infrastructure monitoring company
SERVERSCHECK

Preferred Connection: LAN/Ethernet
Connection Check IP: www.google.com

Wired Network Setting

Setting: ☐ DHCP ☒ Fixed

IP Address: 192.168.11.22
Subnet Mask : 255.255.255.0
Gateway : 192.168.11.2

Primary DNS : 8.8.8.8
Secondary DNS : 4.2.2.2

Net BIOS Name : MOBILE_111
Mac Address (HEX) : 00:03:64:03:31:0E

Sensor Menu

- Device Info
- Sensor Status
- Alert History
- Cloud
- User Security Settings
- Network Settings
- Email Alert
- SMS Alert
- SNTP
- SNMP
- Support
- Sensor Calibration
- Firmware Update
- Reboot

Choosing either “LAN/Ethernet” or “Always Mobile” will make the unit only use that kind of connection. In order to use your mobile connection as a backup Internet connection, choose the option “Mobile as Backup”.

In order to get your mobile Internet connection working, make sure to fill out the “APN Name” field at the “Mobile Setting” correctly according to your ISP.

27.4. Ping Check

Also, as mentioned before, included on the top section is a field entitled “Connection Check IP”. This can be used to check your Internet connection as this Ping check will appear on the “Sensor Status” page as shown below:



the infrastructure monitoring company
SERVERSCHECK

Sensor Status

State	Id	Type	Name	Current Value	Warning Range	Down Range	Repeat Alarm	Email	SMS	SNMP Trap
	Internal Temp	Temp	Int. Temp	25.48 °C	< 18.0 or > 30.0	< 15.0 or > 41.0	☐	☒	☒	☒
	Ping	Ping	Ping	42.00 ms	> 100	> 200	☐	☐	☐	☐

Update | Reset

Sensor Menu

Device Info

Sensor Status

Alert History

Cloud

User Security Settings

Network Settings

Email Alert

SMS Alert

SNTP

SNMP

Support

Sensor Calibration

Firmware Update

Reboot

28. Cloud Platform

With ServersCheck's cloud platform, your SensorGateways will now be more manageable even without the use of other integration software. This feature will only be applicable to SensorGateways running at least on firmware Release 4.0. and with its control feature only available to firmware Release 6.0. and above.

28.1. Registration

On the cloud tab, click the highlighted button below to go to ServersCheck's cloud platform website.

Cloud Settings

Enable Cloud Data Upload : ☐

Device ID :

PIN :

You can find your Device ID and PIN code in the Cloud portal.

Click [here](#) to access / create your account.

[Wireless Information](#)

[Alert Log](#)

[Cloud](#)

[User Security Settings](#)

[Network](#)

[Email Alert](#)

[SMS Alert](#)

[SNTP](#)

[SNMP](#)

You will be taken to the web page: <https://my.infrastructuremonitoring.com/>

Create a new account and make sure to verify your account by responding to the confirmation email message.

LOGIN

Email:

Password:

☐ Remember me

[Forgot password?](#)
[Create new account](#)

GO

Upon doing so, you can now proceed to register your SensorGateway to your cloud account.

28.2. SensorGateway Identification

From your cloud dashboard, click "Add New Device" to name your SensorGateway and save it. After that, you will see the credentials associated with that as seen on the screenshot.

SGW 12 - Wireless

Status: **ok**

Device ID:

Device PIN:

On the SensorGateway that you want to associate with the newly added device, go to the Cloud section and enter the generated credentials. These will of course be unique on each of your SensorGateways.

28.3. Sensor Dashboard

Now that that's done, after 1-2 minutes maximum, you should now see your sensors by clicking "Data" on the newly added device.

SGW 12 - Wireless

Device ID: 
Device Created - 19/12/2013 09:22:47
Last Update - 23/12/2013 08:37:29
Share sensor data: [get link](#)

24.37	24.75	23.81	24.09	56.95	26.51
EXT TEMP WT-0013	EXT TEMP EXT. TEMP	EXT TEMP WTEMP3	EXT TEMP WTEMP1	HUMIDITY WTH-0005	INT TEMP INT. TEMP

In this section, you can optionally hand out read-only access to this specific SensorGateway by clicking "get link" on "Share sensor data."

Read Only Access to Sensor Data

This feature allows you to share sensor data with other users without giving them the access to edit or modify your data.

Access is granted on a per device basis.

 [Generate read only link](#)

After clicking the generate button, you'll be seeing the following:

Read Only Access to Sensor Data

By sharing following link you can give other users access to the values of the device.

https://my.infrastructuremonitoring.com/sensordata_readonly.php?ID=GeKjXm

 [Deactivate read only link](#)

Additionally, after handing them out, you have the option to deactivate the link by simply clicking the associated button.

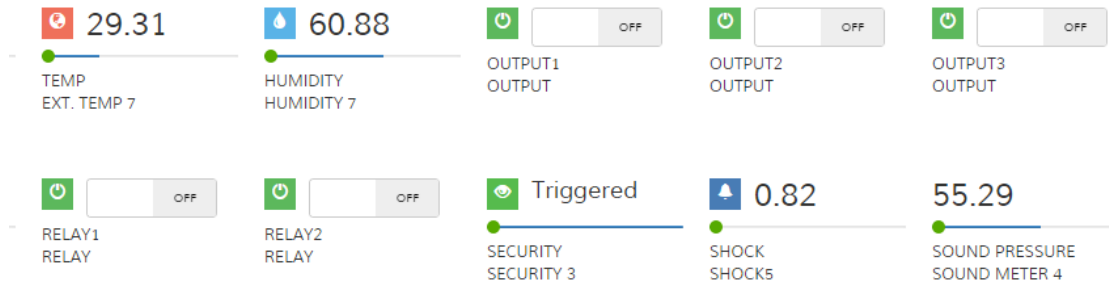
28.4 Trigger control outputs via the Cloud

Disclaimer

Only works with firmware version 6, which is available as an update to sensor gateways purchased from 2014 and onwards. And would only work with ServersCheck I/O Probe and Sensor Hub.

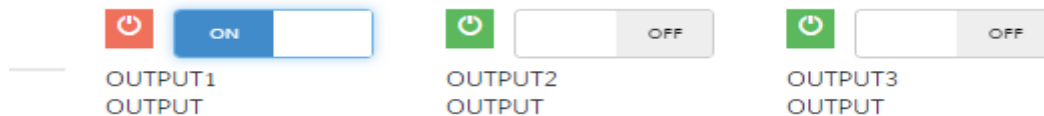
How it works

The Control feature of the Cloud platform is with the I/O devices or commonly called the Dry contact solution. This enables you to have the option to turn an Output or a Relay ON or OFF remotely.

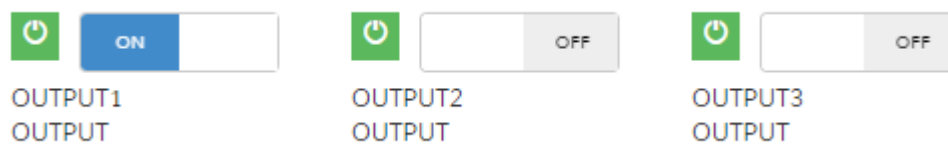


Once the cloud is in sync with the gateway it will show the status of the triggers for the outputs and relays. Upon changing the status to either ON or OFF, the icon will change from green to red which means our cloud is trying to communicate with our gateway.

****from OFF to ON****



In 1-2 minutes the status icon should revert back to green and switch to ON



**** you can then remotely turn an air conditioning ON or lock an electronic door remotely examples on what you can do with this cloud control****

Note:

Do not use Special characters under the Name Tab and preferably only letters and numbers, refer to the image.

Output Control

State	Id	Type	Name	Current Value	Default State	Control Output
☒	IO Sensor	Output	Output1	OFF	OFF ▼	CYCLE
☒	IO Sensor	Output	Output2	OFF	OFF ▼	CYCLE
☒	IO Sensor	Output	Output3	ON	OFF ▼	CYCLE
☒	IO Sensor	Output	Output4	ON	OFF ▼	CYCLE
☒	IO Sensor	Relay	Relay1	ON	OFF ▼	CYCLE
☒	IO Sensor	Relay	Relay2	OFF	OFF ▼	CYCLE
			Update	Reset		

Input Status

Status	DI	Name	Value	Time(ms)	Normal State	Repeat Alarm	Email	SMS	SNMP Trap	Trigger Output	Set Output State To
☒	1	UndefinedIO test1	OK	500	Open ▼	☐	☐	☐	☐	Output1 ▼	ON ▼
☒	2	UndefinedIO test2	OK	500	Open ▼	☐	☐	☐	☐	Output2 ▼	ON ▼
☒	3	UndefinedIO test3	OK	500	Open ▼	☐	☐	☐	☐	Relay1 ▼	ON ▼
☒	4	UndefinedIO test4	OK	500	Open ▼	☐	☐	☐	☐	Relay2 ▼	ON ▼
			Update	Reset							

* Do not use special characters as an input within the red circle preferably only letters and numbers*

28.5 Alerts

The ServersCheck Cloud Platform provides 2 kinds of alerts: threshold and if-then (IFT) alerts. While the 2 methods will be discussed in greater detail on the following sub-sections, the main difference between the two would be their respective scopes.

For the threshold alerts, configuring an alert would be automatically applied to all devices registered on the Cloud Platform. For IFT alerts, one could filter the alerts so as to apply it only on the desired conditional scenario(s). Despite their difference, both functionalities remain to be interoperable with each other.

28.5.1 Threshold Alerts

Alerts defined here will be completely independent from what was configured on the associated SensorGateway since you'll be defining new thresholds and email address for the alert to be sent.

On the "Alerts" tab, click "Add New Alert" to get started.

Add new alert

Sensor Type

Temp

CriticalLow

WarningLow

WarningHigh

CriticalHigh

10

15

28

30

Email

myemail@address.com

Save

After which, you should now see it listed on the present tab. And as listed, you can easily edit your alert's settings by clicking "Edit."

dew point	8	10	17	18		Edit	Delete
dry contact	1	15	1	1		Edit	Delete
flooding	1	0	2	3		Edit	Delete
flow rate	0	1	20	30		Edit	Delete
fuel level	10	20	70	80		Edit	Delete
humidity	40	45	60	62		Edit	Delete
lost						Edit	Delete
power fail	1	1	1	1		Edit	Delete
security	1	2	3	4		Edit	Delete
shock	0	0	0	1		Edit	Delete
sound pressure	10	20	40	50		Edit	Delete
temp	10	15	28	30		Edit	Delete
volt meter	0	5	40	50		Edit	Delete
watt meter	0	5	40	50		Edit	Delete

28.5.2. If-Then (IFT) Alerts

To begin with, simply proceed to “IFT Alerts Settings” then click “Add New IFT Alert.” Upon doing so, you should see the first section for your IFT alerts appearing.

The screenshot shows the 'IFT Alerts setting' page. At the top, there's a navigation bar with 'Home', 'Map', 'Devices', 'Sensors', and 'Alerts'. Below this, there are tabs for 'Alerts history', 'Threshold Alerts Settings', and 'IFT Alerts Settings'. The main heading is 'If-Then Alerts setting'. On the right, there's a button 'Add New IFT Alert' and a 'Delete alert' button. The main area has two sections: 'If:' with a '+ Add condition' button and 'Then:' with a '+ Add action' button. Below these, there are two blue informational boxes: 'You can arrange alerts by drag'n'drop' and 'Alerts not containing a sensor type condition and at least one action will be ignored.'

For your conditions, hit “Add condition” and choose whichever parameters you desire. For this demo, we’ll simply select a temperature threshold of 35 degrees for our condition.

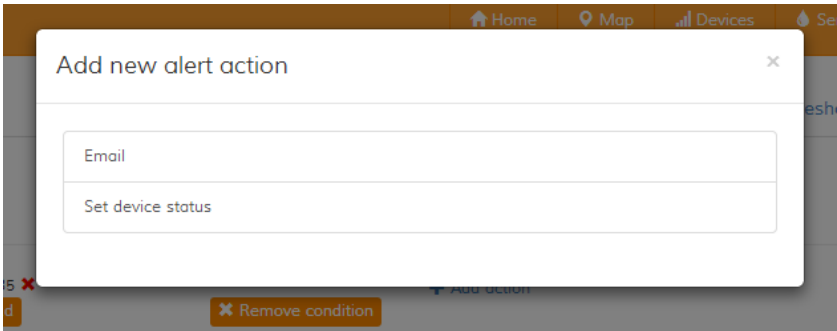
The screenshot shows a modal dialog box titled 'Add new alert condition'. It contains a list of selectable parameters: 'Device', 'Sensor Type', 'Day of the Week', 'Day of the Month', 'Month', and 'Hour'. The 'Sensor Type' option is highlighted.

If-Then Alerts setting

The screenshot shows the 'IFT Alerts setting' page with a condition added. The 'If:' section now displays 'Temp sensor value is higher than 35'. There are buttons for 'Add', 'Remove condition', and '+ Add condition'. The 'Then:' section still shows '+ Add action'.

NOTE: As indicated on the blue note on the lower left page, your conditions should at least contain a sensor type.

For our action, by hitting “Add action,” you can choose to send an email alert, set the device status, or both.



Now after the configured demo, if any of the configured SensorGateway’s temperature sensor goes above 35 degrees, an alert will be sent via email and that device’s status will be set to a “warning” state.

If-Then Alerts setting

↕

If:

Temp sensor value is higher than 35 ✖

lower than ▼ Add

+ Add condition

✖ Remove condition

Then:

Send email to my.email@address.com ✖

Add ✖ Remove action

Set device status to warning

✖ Remove action

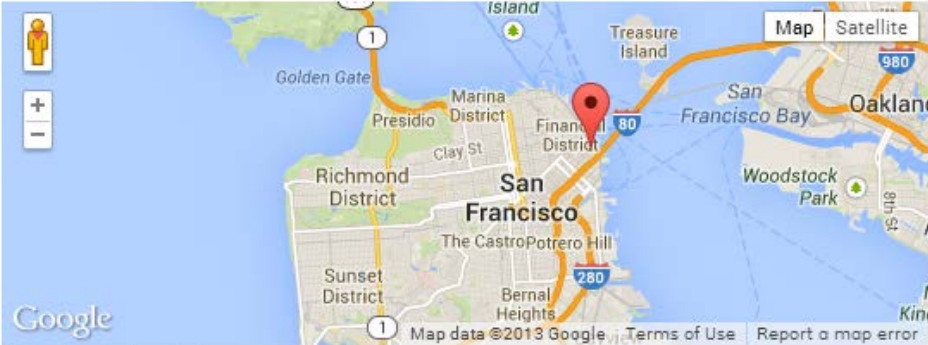
+ Add action

28.6 Geomapping sensors

For a more organized view of your over-all monitoring infrastructure, you could setup the location of each of your SensorGateways.

From the “Devices” tab, click “Location” to set it up.

Edit Device Location



Drag the marker to improve your search.

Lat: Long:

After updating it, you could now navigate to the “Map” tab and view the configured devices.



29. Configuring the ServersCheck Monitoring Software for centralised sensor monitoring

The ServersCheck Monitoring Software allows you to centrally monitor sensors located virtually anywhere. Central Management simplifies the supervision and alerting configuration. With the ServersCheck Monitoring Software one can add the SMS alerting ensure to receive alerts even when the network is down.

All communication between central monitoring software and sensors is over TCP/IP using the UDP protocol on port 161.

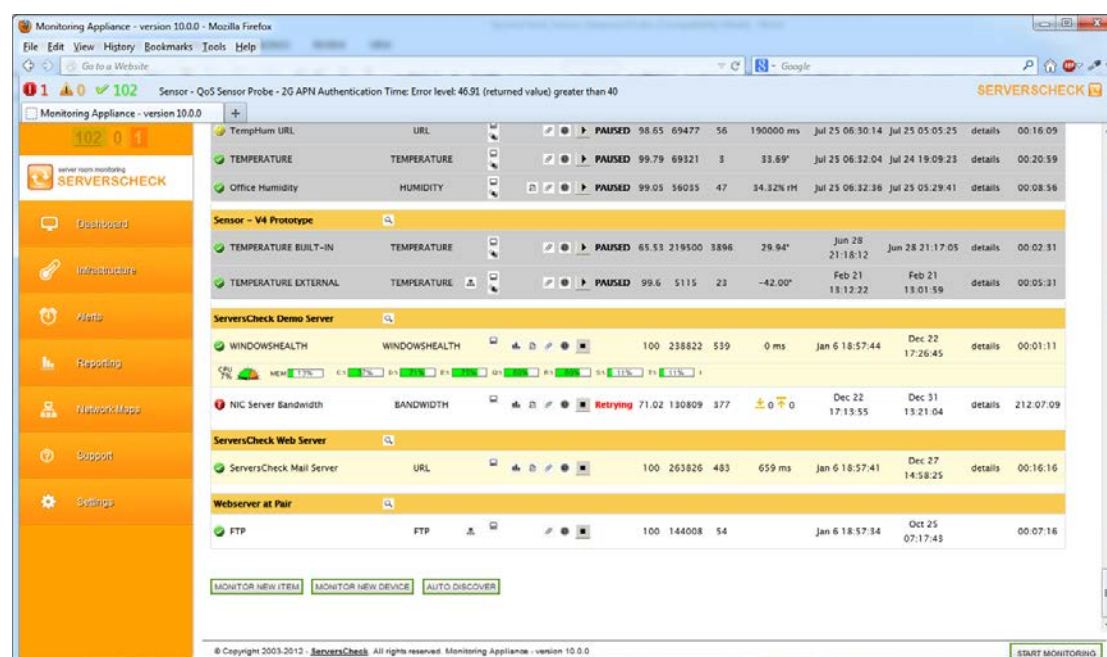
We are now going to configure a temperature check in the ServersCheck Monitoring Software.

The ServersCheck Monitoring Software can be downloaded from following URL :

<https://serverscheck.com/download.asp>

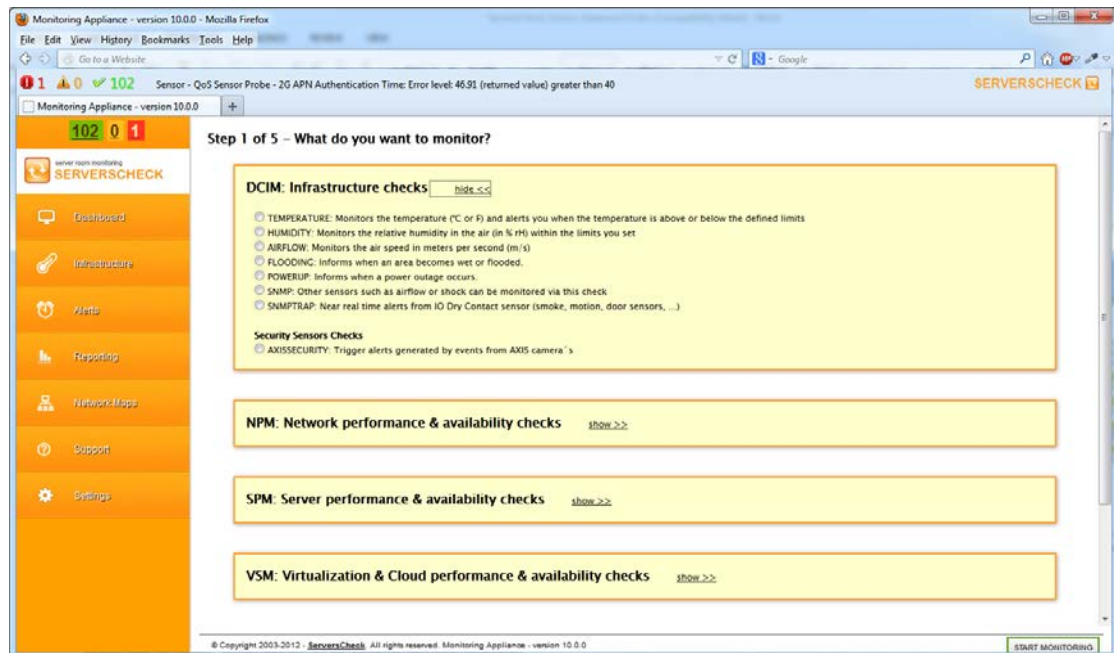
The screenshots below are taken from a ServersCheck Monitoring Appliance.

Point your browser to the web interface of the ServersCheck Monitoring Software. If installed locally, then this is **http://localhost:1272**.



Click on the **"MONITOR NEW ITEM"** button at the bottom of the middle frame.

A new screen like the following will open. Click on the **DCIM Infrastructure checks** group



Select your sensor from the above list and click on the **Next Step** button

Assign a name to the monitor

Monitor label name:

Device that is monitored:

Device name:

IP Address:

Application Group to which the monitor belongs to:

>> STEP 3

In the above screen make sure to have a clear name for the sensor. For a rack indicate for example that it is the Intake temperature. For Device add here the rack – so select **Add New Device** and as a name enter for example **Sensors – Rack 1** and provide the IP address of the Sensorgateway.

Click on the **>> STEP 3** button

Set the frequency interval of checking the environmental condition.

Assign a frequency to the monitor (TEMPERATURE)
How often do you want to perform this monitor? every minutes

When the monitor failed how often do you want to retry it before considering it as down? retries

The temperature check connects to a temperature sensor and retrieves the real-time value captured by the sensor. In a server room temperature should be between 18–27°C or 64–80°F

This check requires a ServersCheck temperature sensor probe. Click [here](#) for more info.

Sensor location

SensorGateway Type

Set status to DOWN when

Above screen with **Sensor Location** will be shown when you have selected a temperature sensor. From the drop down menu select the location of the room – this will be used when creating the temperature heat maps.

The temperature check connects to a temperature sensor and retrieves the real-time value captured by the sensor. In a server room temperature should be between 18–27°C or 64–80°F

This check requires a ServersCheck temperature sensor probe. Click [here](#) for more info.

Sensor location Ambient Room Temperature Monitoring ⓘ

SensorGateway Type Select a SensorGateway Type ⓘ

Set status to DOWN when SensorGateway 2 Probes SensorGateway 1 Probe Serial USB Tibbo

>> STEP 5 **TEST SETTINGS**

Select now your SensorGateway type. Older versions of the SensorGateway did have only one port. Before the 1 port SensorGateways we had serial, Tibbo or USB based sensor probes. Those older versions can still be monitored through a paid license of the ServersCheck Monitoring Software but they are no longer supported.

If you purchased a recent SensorGateway from us then select **SensorGateway 2 Probes**

The temperature check connects to a temperature sensor and retrieves the real-time value captured by the sensor. In a server room temperature should be between 18–27°C or 64–80°F

This check requires a ServersCheck temperature sensor probe. Click [here](#) for more info.

Sensor location Ambient Room Temperature Monitoring ⓘ

SensorGateway Type SensorGateway 2 Probes ⓘ

IP of Device Server 10.0.0.30

Community string public

Sensor Probe ID DETECT PROBES

Set status to DOWN when the temperature is greater than

>> STEP 5 **TEST SETTINGS** **BACK**

A set of new options are shown. The IP address is already automatically added based on the device parameters configuration a few screens earlier

Click on the **DETECT PROBES** button. It will now scan the SensorGateway and return all values it can find.

Sensor Probe ID

Set status to DOWN when

>> STEP 5

TEST SETTINGS

1: jprashant - 24.19

1: jprashant - 24.19

5: jprashant - 18.87

9: jprashant - 45.70

13: -

17: -

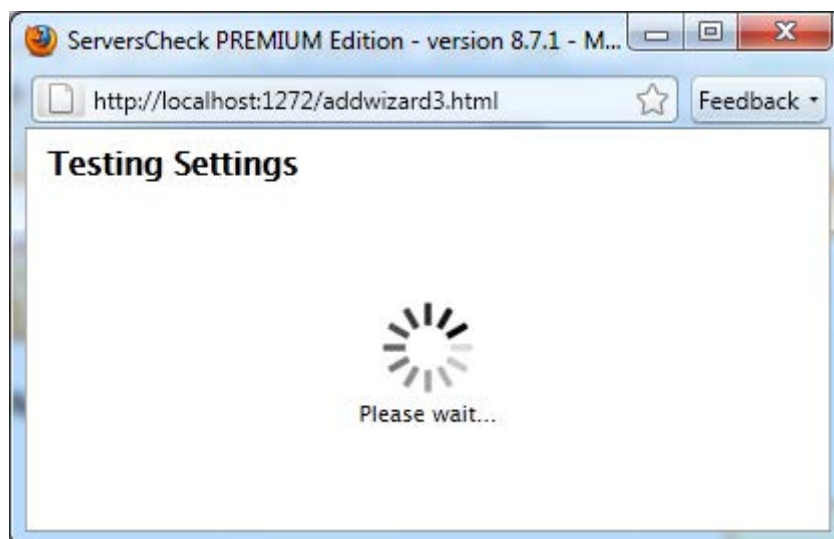
DETECT PROBES

reater than

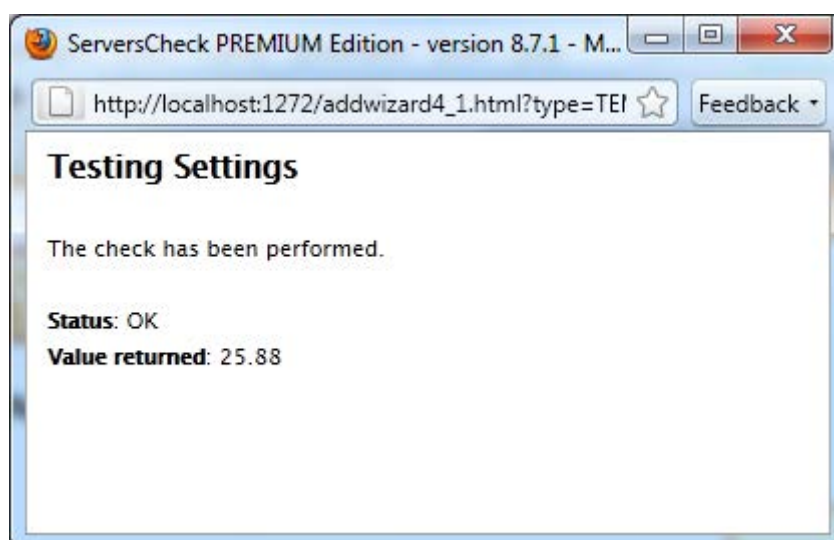
Select the probe ID from the list.

In the last line set when you want to be alerted. In the above example this is when the temperature is greater than 27° C or 81°F based on ASHRAE Standards. You can find the threshold values in our best practices document at http://www.serverscheck.com/sensors/temperature_best_practices.asp

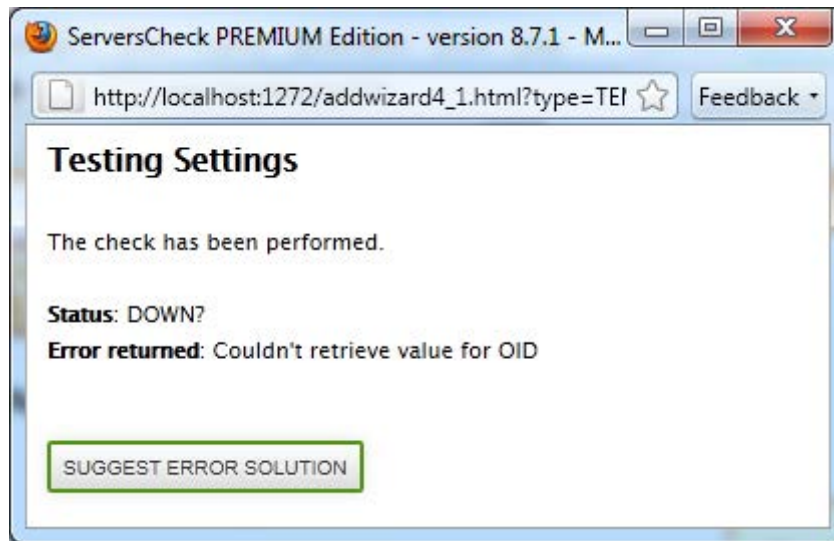
Click on **TEST SETTINGS** to verify your settings.



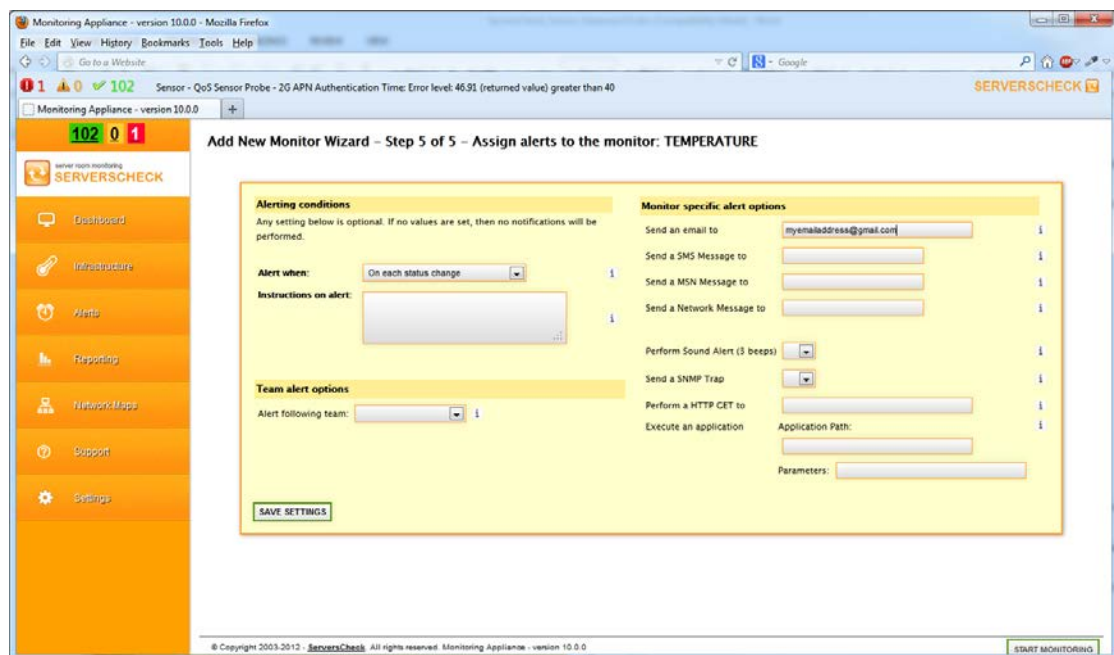
The value being returned is the temperature value as read from the sensor.



If you get a reply like in the following screen with the error “Couldn’t retrieve value for OID” then simply reboot the sensor.



Click now on the **STEP 5** button to define how you would like to be alerted.



Click on **SAVE SETTINGS**

The temperature monitor has now been added to the list of items being monitored.

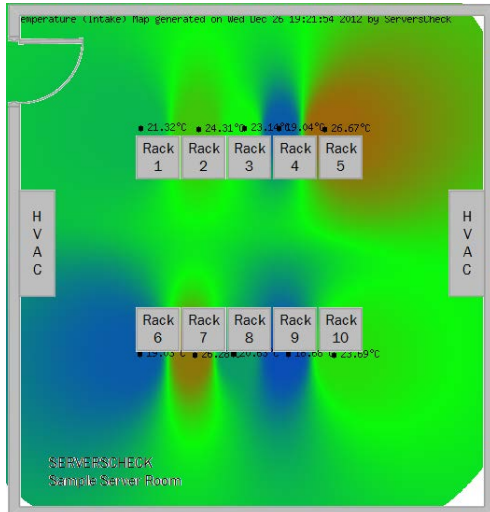
For further instructions on configuring the Monitoring Software, please visit <https://wiki.serverscheck.com>

30. Configuring heat maps in the Monitoring Software

The ServersCheck Monitoring Software / Appliance has the feature as of release 10.0.0 to create heat maps for temperature, humidity and airflow.

In this chapter we assume that you have setup all your sensors as described in section 18 of this manual.

Following is a sample heat map:



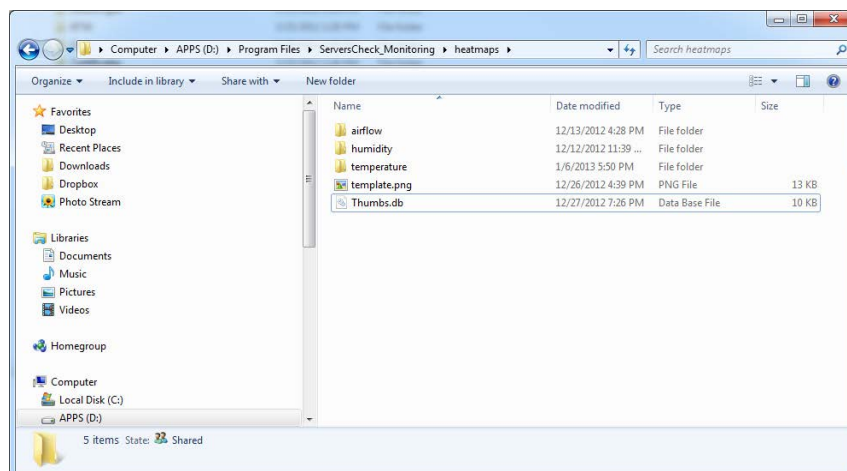
28.7 Creating a floor map of the server room or data center

The first step is to create a floor map of your server room or data center. If you don't have one ready then we recommend creating one in Visio or similar.

Important to note is that the heat map layer is plotted on top of what is white. So set your drawing to white as background.

The floor plan has to be saved in a PNG file format – this is very important. It will fail if you save it any other format than PNG

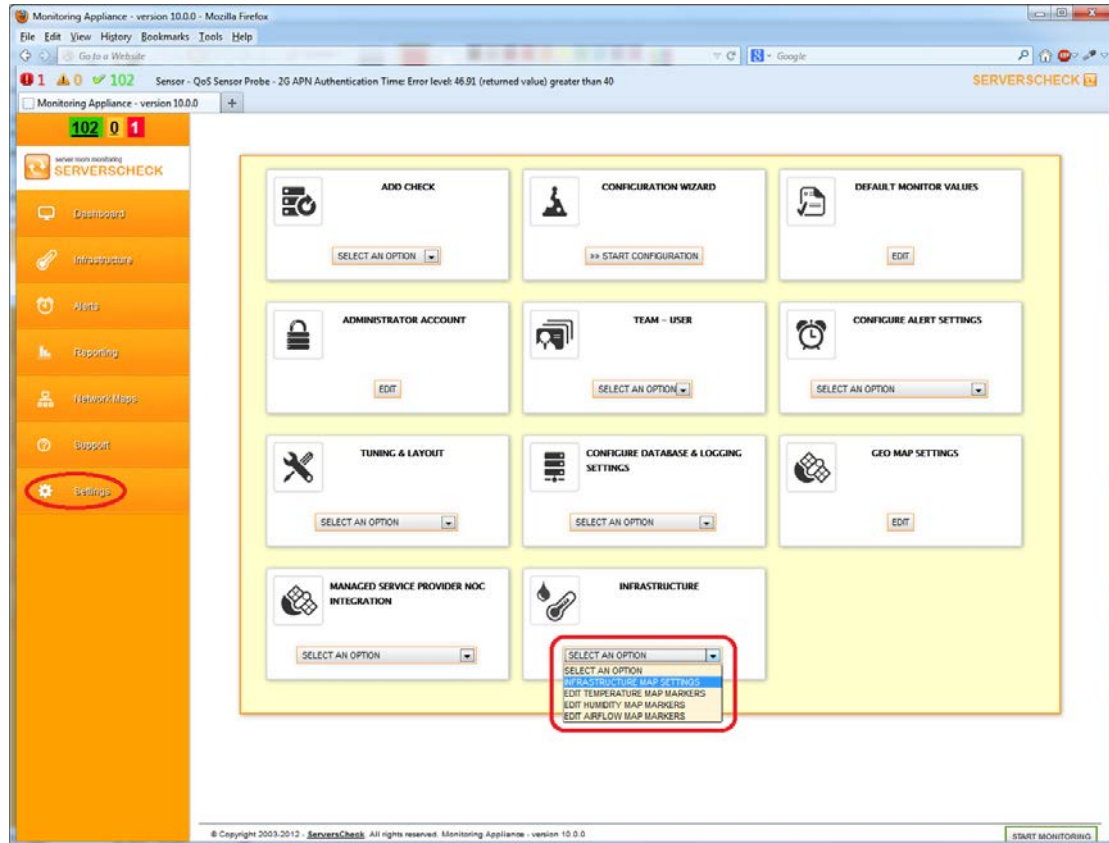
Name your file **template.png** and save it in the **/heatmaps** subfolder of your main ServersCheck_Monitoring folder



28.8 Preparing the heat maps in the Monitoring Software

With your browser go to the home page of the ServersCheck Monitoring Software. Typically this is <http://myservername:1272>

Now select the option **Settings** from the home page. You will notice the **Infrastructure** tile in the settings options. Select in there the option **Infrastructure Map Settings**



On the Infrastructure Map Settings page you can configure following items:

- The temperature unit being used: Celsius or Fahrenheit - this is important as the software will automatically color zones based on the ASHRAE standards for server rooms & data centers
- Sensor radius: this is the width of the circle being drawn for that sensor – this allows to fine tune based on scale of floor map
- The software can create archive maps of heat maps for historic analysis & audit trails. The archived maps are stored in the respective **archive** subfolders. For temperature this is **/heatmaps/temperature/archives**

Infrastructure Map Settings

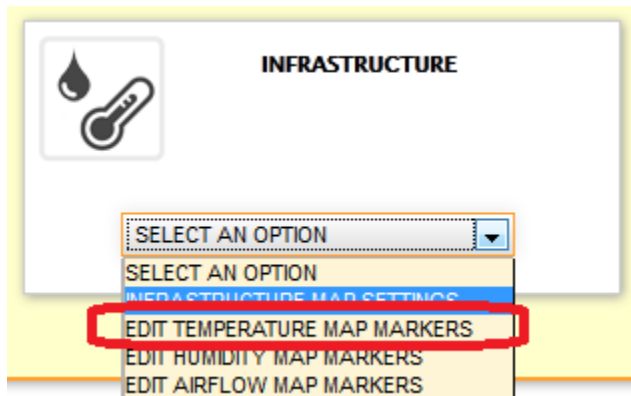
Temperature Scale ☒ ° Celsius ☐ ° Fahrenheit

Sensor Radius pixels

Archive heat maps every minutes

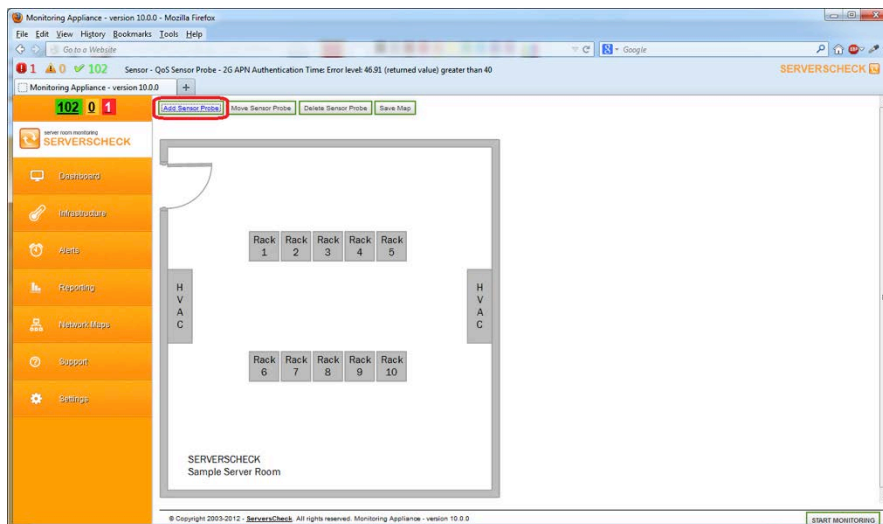
28.9 Mapping sensors on your floor plan

Now that you defined the general settings it is time to map the sensors on your floor plan.

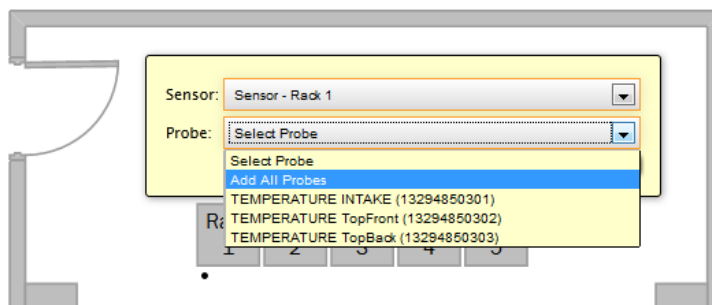
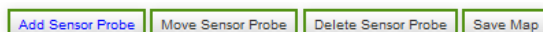


Select the option **EDIT TEMPERATURE MAP MARKERS** in the above **Infrastructure** tile on the **Settings** page of the Monitoring Software

A new page will load with the floor plan that you just saved on the server. Now click on the **Add Sensor Probe** – you will notice that the menu option turns blue indicating that it is active.



With your mouse click on the floor plan where you want your probe to be added. A new dialog window will open:



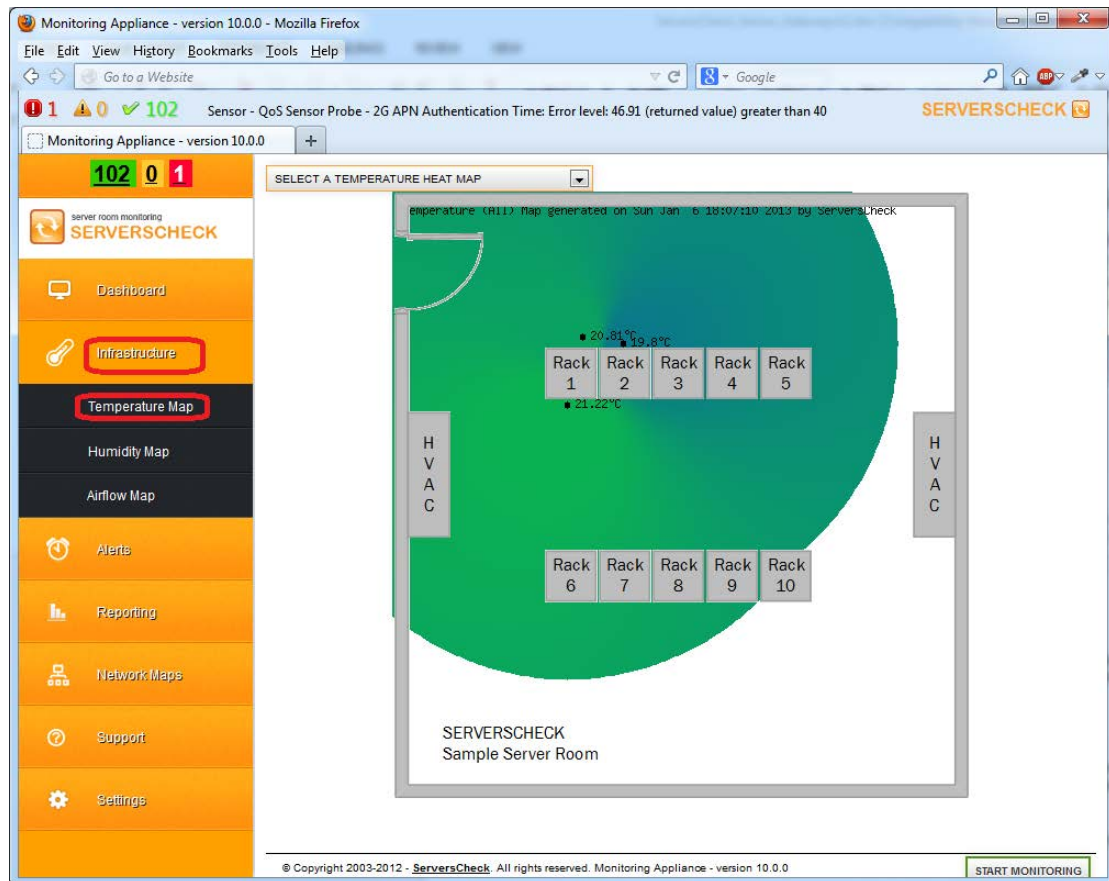
When you click on **Add All Probes** then all probes linked to that sensor (=Device in the Monitoring Software) will be added at once onto the floor map. To add individual probes, simply select the probe from the list.

Click on **Save Map** to save your mappings.

You can move a probe by clicking on the **Move Sensor Probe** button and then pointing with your mouse on a probe. The cursor will change in a cross and you can drag & drop it to the new position. Don't forget to click on the **Save Map** to save the move.

Restart the Monitoring Service once you have added all your sensor probes. It will now load your new configuration and start plotting the heat maps.

To view your heat maps click on the **Infrastructure** menu option and select the type of heat map you want to view (**Temperature, Humidity or Airflow**)



31. Power Rating

A SensorGateway can be provided with up to 12 watts of power from a PoE source. Because of this, careful power budgeting should be done especially when probes like the IO, QoS, and fuel sensors are to be utilized. Below shows the power ratings of ServersCheck sensor modules:

MODULE	POWER RATING
SensorGateway	671 mW
SensorHub	646 mW
Wireless Hub	227 mW
Temperature Sensor Probe	72 mW
Temperature/Humidity Sensor Probe	84 mW
Airflow Sensor Probe	96 mW
Shock Sensor Probe	84 mW
Power Failure Sensor Probe	119 mW
Flooding Sensor Probe	119 mW
Sound Pressure Sensor Probe	168 mW
Security Probe	323 mW
Fuel Sensor Probe	1079 mW
DC Probe	323 mW
DC Probe with Current Transducer	719 mW
AC Probe	323 mW
AC Probe with Current Transducer	1150 mW
IO Probe	371 mW
QoS Probe	347 mW

With the given power ratings, for best practices, the fuel sensor, power meter sensor probes, QoS probe and the wireless hub should be connected to a dedicated SensorGateway as they are more resource intensive in power and memory than the other ones. Know, however, that in the mentioned list, it would be completely fine to use 2 of them in combination on a single SensorGateway (i.e. SensorGateway with IO and QoS probes).